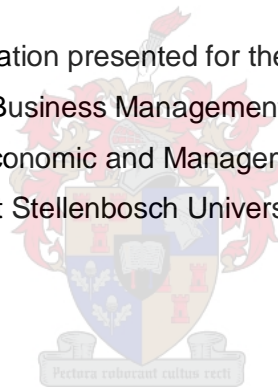


THE EXECUTIVE SPONSOR AS KEY FACTOR IN MEGAPROJECT SUCCESS: AN EXPLORATORY STUDY

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March 2020

Declaration

By submitting this dissertation electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

This dissertation includes two original papers published in peer-reviewed journals or books and one unpublished paper submitted for publication. The development and writing of the papers (published and unpublished) were the principal responsibility of myself and, for each of the cases where this is not the case, a declaration is included in the dissertation indicating the nature and extent of the contributions of co-authors.

Willem Louw

March 2020

Abstract

Megaprojects are defined as 'large-scale, complex ventures that typically cost US\$1 billion or more, take many years to develop and build, involve multiple public and private stakeholders, are transformational, and impact millions of people' (Flyvbjerg, 2014, p. 6).

Having these projects fail at a concerning and unsustainable rate is a major problem for the funders who invest very large sums of money in the projects. These failed projects are also troublesome for the societies in which they are being carried out, and can affect the health of the national economies of the countries involved.

Executive sponsors are primarily allocated to megaprojects of strategic importance that are complex, carry a considerable degree of risk, and are highly visible. A megaproject is thus entitled to a sponsor from the executive (most senior) ranks of an organisation. Although the role of the executive sponsor is merely one of the many decisive factors in the success of megaprojects, it is an essential element that is still much neglected in project management literature. No guide for the identification of the attributes of the executive sponsor could be found in literature nor has the effect of the executive sponsor on megaproject success been studied sufficiently.

A literature review led to the formulation of six propositions and provided a preliminary list of attributes required by project sponsors. From the propositions, six research questions were developed. Answering these questions ultimately attained the research aim, namely *to identify the important and essential attributes of a sponsor on a megaproject*.

The investigation was conducted by means of a multiple-case study research design. Primary research data was acquired via semi-structured interviews and a survey questionnaire.

The dissertation reports on the perceptions of 26 executives with *circa* 250 years of combined megaproject experience. These executives played key roles on six South African megaprojects completed since 2006.

The data from the survey questionnaires was analysed through a bottom-up numerical method while the data from the semi-structured interviews was analysed with the qualitative content analysis method.

The findings of the research include information on important and essential attributes that an executive sponsor should have to increase the probability of megaproject success. The single most significant attribute required is appropriate seniority, being empowered and accountable, with apposite credibility and with both personal and positional power. The list of attributes developed, and their ranking, contribute to the sparse literature on this topic and

provides valuable guidelines for boards of companies and executives who appoint sponsors on megaprojects. These guidelines could contribute to the future success of megaprojects.

The dissertation explains how leadership theories are used to identify instruments that can assist in the assessment of the leadership style and attributes of an executive sponsor. A framework for this is duly proposed.

Implementing an approach in which the attributes of a potential megaproject sponsor are assessed is neither revolutionary nor a very difficult or costly process. It is also no 'silver bullet' solution to a very complicated problem – the failure of megaprojects. It does, however, have the potential to result in a very significant return on investment.

Keywords: Executive sponsor, project sponsor attributes, project sponsor effectiveness, project sponsor leadership, megaproject, megaproject success

Opsomming

'n Megaprojek word gedefinieer as 'n grootskaalse, komplekse onderneming wat tipies US\$1 miljard of meer kos, etlike jare neem om te ontwikkel en te bou, veelvuldige staats- en privaat belanghebbendes betrek, transformerend van aard is, en miljoene mense beïnvloed (Flyvbjerg, 2014, p. 6). Megaprojekte misluk teen 'n kommerwekkende en onvolhoubare tempo en beskik oor die potensiaal om die welstand van nasionale ekonomieë te beïnvloed. Die situasie is problematies, nie alleen vir die befondersers wat groot bedrae geld beskikbaar maak nie, maar ook vir die gemeenskappe wat uit die projekte voordeel sou kon trek.

Uitvoerende bestuursborge word hoofsaaklik aangewys vir projekte van strategiese aard wat kompleks is, 'n beduidende risiko dra, en besonders sigbaar is. Dit is dus duidelik dat 'n megaprojek geregtig is op 'n bestuursborg vanuit die uitvoerende en mees senior bestuursvlakke van 'n organisasie. Alhoewel die rol van die uitvoerende bestuursborg slegs een van etlike bepalende faktore tot die sukses van 'n megaprojek is, maak dit 'n wesenlike bydrae wat in die projekbestuursliteratuur steeds agterweë bly. Geen riglyn kon in die literatuur gevind word wat die identifisering van die eienskappe van 'n uitvoerende bestuursborg aanspreek nie. Daarby is die impak van die uitvoerende bestuursborg op die sukses van 'n megaprojek nog nie voldoende bestudeer nie.

'n Literatuurstudie het gelei tot die formulering van ses stellings en 'n lys van voorlopige eienskappe wat deur bestuursborge van projekte benodig word. Vanuit die stellings is ses navorsingsvrae ontwikkel. Die beantwoording van hierdie vrae het uiteindelik gelei tot die bereiking van die oogmerk van die navorsing, synde die identifisering van die belangrike en noodsaaklike eienskappe van 'n bestuursborg op 'n megaprojek.

Die ondersoek is met behulp van 'n veelvuldige gevallestudie uitgevoer. Primêre navorsingsdata is deur middel van semi-gestruktureerde onderhoude en 'n opnamevraelys ingesamel.

Die proefskrif doen verslag oor die waarnemings van 26 uitvoerende bestuurslui met ongeveer 250 jaar gesamentlike ervaring op megaprojekte. Hierdie uitvoerende bestuurslui het kernrolle vervul op ses Suid-Afrikaanse megaprojekte wat sedert 2006 voltooi is.

Die data vanuit die opnamevraelys is met behulp van 'n opwaartse numeriese metode ontleed, terwyl die data wat vanuit die semi-gestruktureerde onderhoude verkry is met behulp van die kwalitatiewe inhoudsanalise-metode ontleed is.

Die bevindings vanuit die navorsing sluit in inligting oor belangrike en noodsaaklike eienskappe wat 'n uitvoerende bestuursborg behoort te besit om die waarskynlikheid van sukses van 'n megaprojek te verhoog. Die mees beduidende eienskap benodig, is dié van

toepaslike senioriteit, om bemagtig en aanspreeklik te wees met gepaardgaande geloofwaardigheid asook om oor beide persoonlike en posisionele mag te beskik. Die lys van eienskappe wat ontwikkel is, en hul rangorde, dra by tot die beperkte literatuur oor die onderwerp en verskaf waardevolle riglyne aan maatskappydireksies en uitvoerende bestuurders wat verantwoordelik is vir die aanstelling van bestuursborge op megaprojekte. Hierdie riglyne kan bydra tot die toekomstige sukses van megaprojekte.

Die proefskrif verduidelik hoe leierskapsteorieë benut word om meetinstrumente te identifiseer wat kan help met die assessering van die leierskapstyle en eienskappe van 'n uitvoerende bestuursborg. 'n Raamwerk hiervoor word voorgestel.

Die implementering van 'n benadering waarmee die eienskappe van 'n potensiële megaprojekbestuursborg geassesseer word, is nie revolusionêr nie en boonop nie 'n baie moeilike of duur proses nie. Dit is ook geen wonderkuur vir 'n ingewikkelde probleem nie – die mislukking van megaprojekte. Dit beskik egter oor die potensiaal om 'n beduidende opbrengs op belegging te lewer.

Sleutelwoorde: Bestuursborg doeltreffendheid, bestuursborg eienskappe, bestuursborg leierskap, megaprojek, megaprojek sukses, uitvoerende bestuursborg

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CHAPTER 1

ORIENTATION

1.1 INTRODUCTION

A megaproject is defined as any project with a total capital cost (materials, engineering, and construction labour costs associated with completing a project) equal to or greater than US\$1 billion at the 1 January 2003 dollar value (Davies, Dodgson, Gann & MacAulay, 2017; Flyvbjerg, 2014; Ghosh, Williams, Askew & Mulgund, 2012; Irimia-Dieiguez, Sanchez-Cazorla & Alfalla-Luque, 2014; Mellow, 2011).

Flyvbjerg (2014, p. 6) defined megaprojects as 'large-scale, complex ventures that typically cost US\$1 billion or more, take many years to develop and build, involve multiple public and private stakeholders, are transformational, and impact millions of people'. It appears that the nominal value of US\$1 billion has not changed since 2003, as it continues to be used to define megaprojects.

For the purpose of this research (megaprojects in the period 2006 to 2016), a megaproject is defined as a project with a value equal to or greater than ZAR10 billion equating to US\$1 billion. This figure is based on the US\$/ZAR exchange rate for the period 2006 to 2016. The period was arrived at as a reasonable and representative time frame, given the completion (or near-completion) of a number of industrial and infrastructure megaprojects in South Africa.

Reflecting on the success (and failure) of major projects, in 1987 Morris and Hough produced perhaps the seminal publication on these major (later to be referred to as mega-) projects (Dalscher, 2012). They stated that the track record of major projects at the time was fundamentally poor. This was particularly so for the larger and more difficult projects, which were often completed late or over budget, did not perform in the way expected, and appeared to be failures in the view of the public. Having these projects fail at a concerning and unsustainable rate was problematic for the funders who made very large sums of money available. It was also problematic for the societies in which they were being carried out, and for the health of the global economy.

Flyvbjerg, Bruzelius and Rothengatter (2003) and Miller and Lessard (2001) identified the key issue in the success or failure of a megaproject to be the sponsor. In particular, the role of the sponsor was found to be critical in influencing the progress and outcome of a megaproject.

A number of industrial and infrastructure projects costing more than ZAR10 billion/US\$1 billion have been completed in South Africa since 2000. The failure rate of these South African megaprojects did not differ much from the typical global figure of 65% or more (Merrow, 2011). Within this context the research reflects on the literature and elaborates on the relationship between the role of the sponsor, the effectiveness of the role, and the personal attributes required in performing the role.

For the purpose of the research, the term 'project' includes the descriptors project-based programme and megaproject. Similarly, the term 'project manager' includes the descriptors project director, programme manager and programme director. The Project Management Institute (PMI, 2014) stated that executive sponsors were allocated primarily to projects of strategic importance. These projects were normally complex, carried a certain degree of risk, were highly visible, and were allocated a very sizeable budget. It could accordingly be deduced that a megaproject sponsor was from the executive (most senior) ranks of an organisation. For the remainder of this research, where the megaproject sponsor connotation is used, it implies by default that the sponsor is an executive sponsor.

Literature indicated that the personal attributes of the sponsor directly influenced his/her effectiveness in the role (Association for Project Management (APM), 2009; Barshop, 2016; Bucero & Englund, 2007; Crawford, Cooke-Davies, Hobbs, Labuschagne, Remington & Chen, 2008a, 2008b; Helm & Remington, 2005; Morris, 2013; PMI, 2014; Remington, 2011; Van Heerden, Steyn & Van der Walt, 2015; West, 2010). This had a distinct bearing on the success of the megaproject.

The aim of the research is the identification of, within the broad array of attributes described by literature, those attributes that are important for the sponsor to possess. These important attributes are further refined in the research to those that are essential for megaproject success. By identifying the attributes mentioned in the research aim, it contributes to the improvement of the current (poor) success rate of megaprojects in South Africa.

Identification of both the important and essential sponsor attributes, and by implication increasing the rate of success of megaprojects, will potentially contribute not only to the health of the South African economy, but also to the health of the economy of the African continent.

Although several authors indicated the central role the sponsor played in the success or failure of megaprojects, no guide for the identification of the attributes of the sponsor existed. Nor has the effect of the sponsor on megaproject success been studied sufficiently. The research makes a contribution in this regard.

The remainder of this chapter will deal with the problem statement for the research and the accompanying gap, the research aim and questions and the research strategy. The research strategy includes specific reference to the research philosophy and approach. Thereafter follows an explanation of the importance and contribution of the research and a clarification of key concepts used in the research. The chapter concludes by providing an outline of the remaining chapters of the dissertation.

1.2 PROBLEM STATEMENT AND GAP

The problem statement for this research is multi-faceted. In the context of the very poor track record of global megaprojects, the following aspects needed to be addressed in the research:

- The insufficient investigation into the effect of the sponsor on megaproject success;
- The sponsor attributes identified in previous research are so wide that it is unlikely that all these attributes will be found in a single person;
- In the context of the megaproject, the 'normal' human being has a limited capacity and a reasonable expectation is for an individual to possess five to ten sponsor attributes with seven being the practical number;
- Certain attributes are more important than others. Some are essential for project success while others are important enough to be kept on a 'reserve list'; and
- The lack of guidance to those who have to appoint megaproject sponsors.

Whilst the poor success rate of megaprojects is key in the problem statement, the research commences with the aim of closing the gap via the determination of the reasonable number of important and essential attributes that a megaproject sponsor should possess. The practical implication of distinguishing between essential and important attributes would allow management to draw on a list of 'reserve' attributes (important but not essential) to assist in distinguishing between sponsor candidates when assessing their suitability for the role. This would be particularly helpful when the assessment of essential attributes did not do that conclusively.

1.3 RESEARCH AIM AND QUESTIONS

For the research a framework similar to that described by Yin (2014) was developed. This framework reflects the research aim, research questions and propositions and is illustrated in Figure 1.1. This figure also appears as Figure 2.3 as part of the published paper in Chapter 2.

1.3.1 Research aim

As already alluded to in Section 1.2, the research aim is to identify the important and essential attributes of a sponsor on a megaproject. The research aim is derived from the research questions that in turn are derived from the propositions for the research.

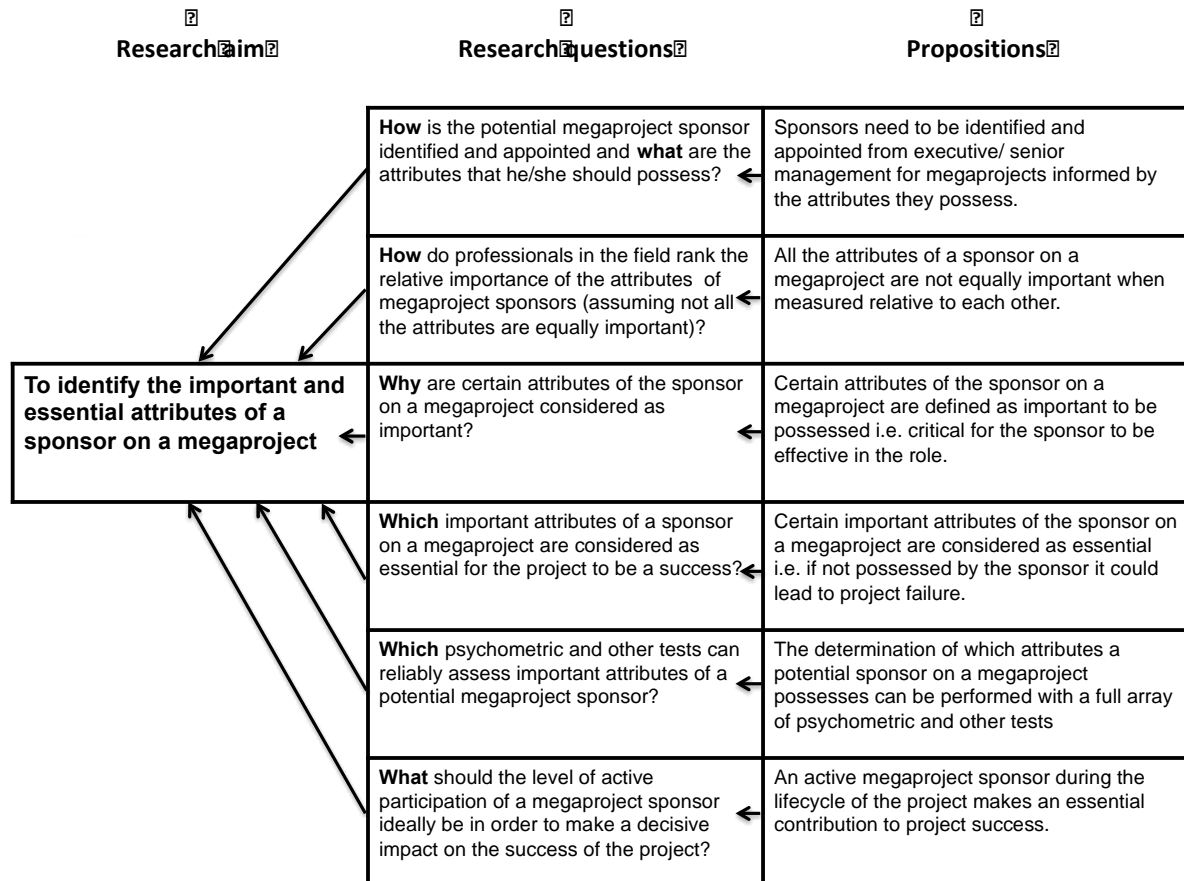


Figure 1.1: Research aim, research questions and propositions

1.3.2 Research questions

A list of the proposition-based research questions is provided as follows:

Research question 1: How is the potential megaproject sponsor identified and appointed and what are the attributes that he/she should possess?

Research question 2: How do professionals in the field rank the relative importance of the attributes of megaproject sponsors (assuming not all the attributes are equally important)?

Research question 3: Why are certain attributes of the sponsor on a megaproject considered as important?

Research question 4: Which important attributes of a sponsor on a megaproject are considered as essential for the project to be a success?

Research question 5: Which psychometric and other tests can reliably assess important attributes of a potential megaproject sponsor?

Research question 6: What should the level of active participation of a megaproject sponsor ideally be in order to make a decisive impact on the success of the project?

1.4 RESEARCH STRATEGY

The research strategy selected for the research is the case study. Both Robson (2002) and Yin (2014) highlighted the importance of context in their respective definitions of 'case study'. Particularly so by Yin, who emphasised that the borders between the case being studied and the context in which it was studied were generally not clearly defined. The researcher contends that for large-scale, complex or complicated megaprojects, involving multiple public and private stakeholders, the borders between the cases and their context are at times rather nebulous. This is especially so for the identification of the important and essential attributes possessed by the sponsor and the identification or appointment of the sponsor.

The research, because of its exploratory nature and in asking very specific 'what' and 'how' questions regarding the important and essential attributes to be possessed by the sponsor, aligns itself well with the case study methodology or strategy.

At this juncture it is valuable to reflect how the research strategy was arrived at. The 'onion ring' concept developed by Saunders, Lewis and Thornhill (2009, p. 108), assisted in this regard.

1.4.1 Research philosophy

The philosophical basis for the research is a realism-based ontological approach that migrates over time from an interpretivist (post-modern) ('becoming') to a post-positivist (realism-based) ('being') ontology (Morris, 2013). It therefore implies that the researcher views the world from an interpretivist and post-positivist philosophical perspective. This is accordingly highlighted in red letters in the 'onion ring' diagram in Figure 1.2.

Tashakkori and Teddlie (1998) and Saunders et al. (2009) supported the incorporation of multiple philosophical perspectives in a research philosophy. They suggested that for a particular study it was more appropriate for the researcher to think of his/her adopted research philosophy as a continuum rather than opposites. Based on this, pragmatism was included in the research philosophy.

Implicit in pragmatism is that the research aim is the most important consideration when designing the research method (Saunders et al., 2009). Pragmatism also implies that, if the

research question does not unambiguously suggest a positivist or an interpretivist philosophy, variations in ontology and epistemology can be accommodated.

For the research, this perspective proved to be valuable. It assisted *inter alia* in providing a logical explanation why the researcher considered as important the migration from an interpretivist (post-modern) to a positivist (realism-based) ontological approach over the lifecycle of the project.

1.4.2 Research approach

Saunders et al. (2009) stated that there were two dominant approaches to research, namely induction and deduction. The inductive approach implied that data was collected and the researcher then reflected on what theoretical themes the data was suggesting (as a result of the analysis of the data). The alternative was the deductive approach, in which a theory and a hypothesis (or hypotheses) were developed and a research strategy was designed to test the hypothesis (or hypotheses). Saunders et al. (2009), however, considered that it was possible to combine deduction and induction in the same research. In their experience, it was often found to be advantageous to do so.

In opting for a deductive approach, the theoretical framework for the research is as reflected in Figure 1.2. This figure also appears as Figure 4.2 in Chapter 4.

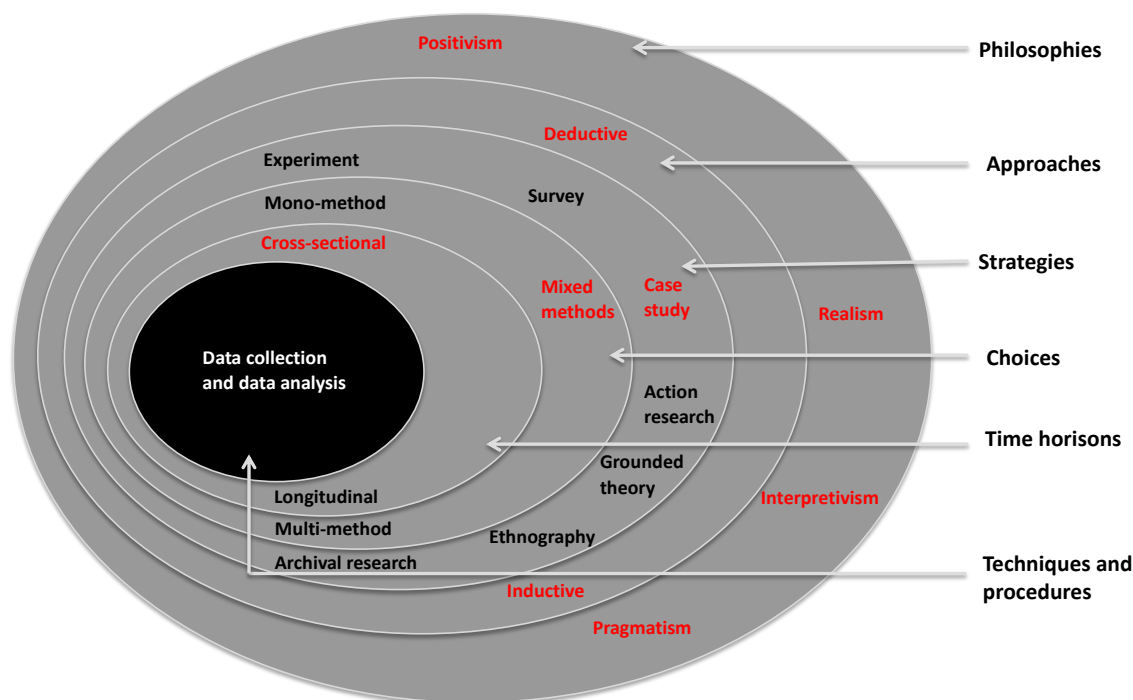


Figure 1.2: The onion ring concept

Source: Extracted from Saunders et al. (2009, p. 108)

For this research, the researcher used open-ended semi-structured interviews (supplemented by a survey questionnaire) and a focus group to collect primary data. Secondary qualitative data was collected from archived documents or records and data available in the public domain. The primary data emanating from the interviews was analysed using qualitative non-numerical software. The results from the questionnaire and the focus group were analysed respectively by quantitative and qualitative non-numerical procedures. A hybrid multi-method qualitative/mixed-method approach was adopted for the research as research method of choice.

The researcher further considered the identification of attributes as an action that took place at a particular time, therefore the selection of the cross-sectional time horizon with the focus on semi-structured interviews, supplemented by the use of a survey questionnaire and a focus group activity.

1.5 THE IMPORTANCE AND CONTRIBUTION OF THE RESEARCH

The aim of the research is the identification, within the broad array of attributes described by literature, of those attributes that are important and essential for the sponsor on a megaproject to possess. Reducing the number of attributes required to the realistic minimum that could be expected of one individual is motivated.

Literature has indicated quite clearly that there was a relationship between the personal attributes of the person carrying out the role of the sponsor and the effectiveness of the sponsor (APM, 2018; Barshop, 2016; Crawford et al., 2008a; Morris, 2013; PMI, 2014; Remington, 2011; West, 2010). In turn the APM (2018) indicated that there was a relationship between sponsor effectiveness and project success.

Sponsor effectiveness is a dependent variable of the personal attributes of the sponsor and project success is a dependent variable of sponsor effectiveness. This implies that when the personal attributes are gainfully utilised, the effectiveness of the individual improves. As a result of an improvement in the effectiveness of the individual carrying out the role of the sponsor, the project has a higher probability of success. This is where the value contribution of the research resides. Given the current poor performance of megaprojects, the magnitude of these projects and improving their probability of success will undoubtedly contribute to the economy of the South African (if not African) region.

1.6 CLARIFICATION OF KEY CONCEPTS

Similar concepts and constructs were likely to be found in a field of study, but were regularly referred to by using different terminology. In such cases the same meaning was often not implied. This necessitated a thorough scrutiny of the wording used. In this context the statement by Neuman (2000, p. 158) that a good definition required 'one explicit, clear and specific meaning' was valuable. The definition should eliminate or at least prevent ambiguity or vagueness in meaning. Clarity of terminologies used in the research is provided at a conceptual level in this section. The terminologies are listed in alphabetical order.

1.6.1 Attributes

Different descriptors were used to describe an attribute in the literature studied. For the purpose of simplicity and consistency, it was decided to use the term 'attribute' in the dissertation and more specifically as it related to the sponsor of a megaproject. An attribute, for the purpose of the research, is defined as 'a quality, character or characteristic ascribed to someone or something' (Merriam-Webster, n.d.).

In the context of attributes, it was found that different descriptors were used to describe what was inherent to the sponsor's effectiveness. Zaccaro, Kemp and Bader (2004) further stated that significant ambiguity and confusion originated from the use of the term 'trait' in the literature. It was often used to refer to temperament, personality, disposition and abilities, as well as any inherent qualities that the individual may have, such as physical or demographic attributes. Given how concepts were used interchangeably as traits and attributes (e.g. personality as a trait and as an attribute), it was not surprising to encounter in the literature an array of descriptors that attempted to describe the attributes of the sponsor. Other than attributes, the list included behaviours, characteristics, skills, attitudes, factors, capabilities, abilities and criteria.

The decision to use the term 'attributes' is supported by the fact that the work by Helm and Remington (2005), which used the descriptor 'attributes', was also cited by Cooke-Davies, Crawford, Hobbs, Labuschagne and Remington (2006), Kloppenborg, Manolis and Tesch (2009), Kloppenborg, Tesch and Manolis (2011), Labuschagne, Cooke-Davies, Crawford, Hobbs and Remington (2006), Sutterfield, Friday-Stroud and Shivers-Blackwell (2006) and Walker (2012).

1.6.2 Complex versus complicated

The element of the complexity of projects deserves some attention in the context of the sponsor and his/her leadership. Stacey (1996) stated that complex projects required extraordinary leadership capabilities and management skills. Remington (2013) also argued that there was a positive correlation between project success and the capacity of the

sponsor to recognise complexity as soon as possible. These perspectives were then juxtaposed against the literature that often distinguished between a complex and a complicated project.

The position of Chapman (2016), Maylor, Vidgen and Carver (2008) and Whitty and Maylor (2009) was that the distinction between the two concepts (complex and complicated) was found in the nature of the relationships between the elements of the project system. Their view was that large-scale engineering and construction projects need not necessarily be viewed as complex projects, but they were complicated projects. For this view to be valid, the interactions with and the influence of the environment needed to be predictable, and could sometimes be trivial.

Based on the Cynefin framework for decision-making (Snowden & Boone, 2007), the difference between complex and complicated is portrayed in Table 1.1.

Table 1.1: Difference between complex and complicated

Complex	Complicated
Relationship between cause and effect cannot be perceived in advance, only in retrospect – the domain of emergence	Relationship between cause and effect requires analysis or some other form of investigation and/or the application of expert knowledge – the domain of experts
Unpredictable – unknown unknowns	Known unknowns
Experiment to find patterns, allow a solution to emerge - there may not be one correct solution	A range of possible answers - at least one correct solution
To deal with problem you first need to probe (experiment), then sense (look for patterns) and then respond (act based on information gleaned from experiments)	To deal with problem you first need to sense (establish facts), then categorise (analyse facts) and then respond (use good practice)

Source: Extracted from Snowden & Boone (2007)

In a more simplistic manner the difference between complex and complicated was described as follows: When it was known what had to be done and the effort might be arduous, a clear pathway to completion was visible and it could be planned then it was complicated. In turn, it was complex when the way to get there was not known and there was no clear pathway to completion.

Based on the differentiation between complex and complicated provided above, not one of the projects studied in the South African context was complex.

1.6.3 Executive sponsor

In defining the terminology around ‘sponsor’ and ‘sponsorship’, significant work has been done by Crawford, Cooke-Davies, Hobbs, Labuschagne, Remington and Chen (2008a, 2008b) who reviewed a number of national and organisational standards for project

management. The standards reviewed were those developed by the PMI, the International Project Management Association (IPMA), the APM, and the Office of Government Commerce (OGC) in the United Kingdom.

Despite an inconsistency between the four standards mentioned above on how the role of the sponsor was carried out (e.g. by either an individual or a group), the similarities were quite clear, and five key themes emerged. The sponsor was:

- At a senior level in the owner (a.k.a. client or customer) organisation;
- In a role involving substantial dimensions of leadership (as opposed to being just a management role);
- Responsible for ensuring that an effective governance framework was created for the project;
- The owner of the business case for the project, and ultimately responsible for the delivery or realisation of the benefits projected within the business case; and
- Positioned structurally on the interface between the owner and project organisations.

See Figure 1.3 for positioning of the sponsor and links with other key parties in a generic organisational context (APM, 2009, 2018). This figure also appears as Figure 2.1 as part of the published paper in Chapter 2. The positioning illustrated in the figure enables decision-making and support for the project manager, particularly for issues beyond the control of the project manager.

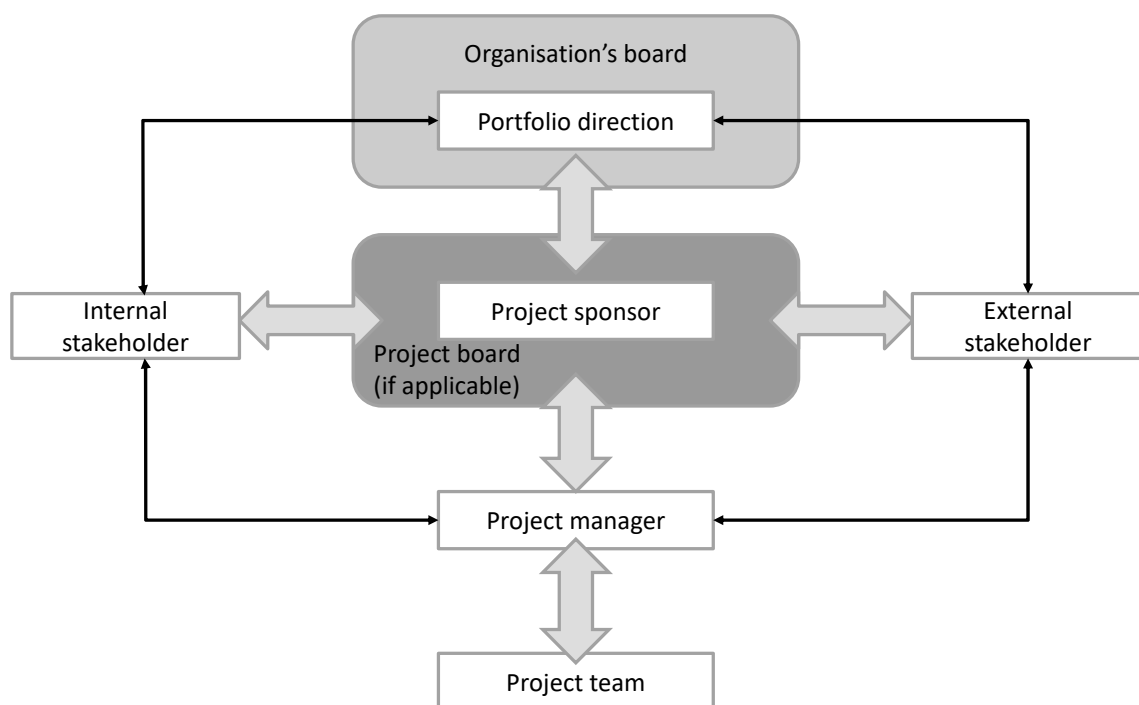


Figure 1.3: Generic organisational context

Source: APM, 2009, p. 3

In an organisational context, the sponsor was considered a critical and pivotal component in an organisation's governance of project management (APM, 2009; Labuschagne, et al., 2006; Morris, 2013). The structure in Figure 1.3, very similar to the model developed by Labuschagne et al. (2006), needed to be read within the context that:

- Vertically down, the sponsor defined the purpose and objectives of the project, provided decisions and resources, and directed the project manager;
- Horizontally, the sponsor provided key communication with internal and external stakeholders and monitored the project context; and
- Vertically up, the sponsor reported on the business case of the project and the realisation of its benefits (both of which were the responsibilities of the sponsor).

The APM (2009, 2018) also provided perspective on the sponsor within a programme. A programme was described as a collection of projects with shared goals and objectives, and whose predicted benefits had to materialise as a whole for the programme to be successful (Morris, 2013).

1.6.4 Important and essential

For the purpose of this research, important is defined as 'having serious meaning or worth: Deserving or requiring serious attention' (Merriam-Webster, n.d.). From the same source essential means 'so important as to be indispensable'.

It is thus clear that essential is a higher order of importance and has accordingly been coupled directly with the success of the project, i.e., to improve the probability of success of the project the sponsor requires a number of essential attributes. It also implies that all essential attributes are important, but all attributes categorised as important are not necessarily essential.

1.6.5 Leadership versus management

As previously mentioned, the literature confirmed that the sponsor role was in essence a leadership role. However, the sponsor was also required to give direction and to clarify the framework for effective governance, of both the organisation and the project. This brought a management dimension to the role. De Klerk (2014) pointed out that decision-making (including strategic thinking and long-term planning) was similarly regarded as a managerial activity within leadership.

The examples provided allowed the researcher to conclude that there was a need and a place for both governance and decision-making in the role of the sponsor, and that it was unwise and incorrect to separate leadership and management in the role too forcefully. The reflections by Bourne (2015), De Klerk (2014), Morris (2013) and West (2010) on the matter of leadership and/or management supported this conclusion.

Remington (2013) argued that leadership roles on large complex projects in the public sector were not as well defined as those on similar projects in the private sector. Her position was that selecting a single sponsor in a private-sector organisation with high leverage who can take responsibility for the success of the project was attainable. However, it was less attainable in the public sector, due to a multi-layered executive leadership structure.

1.6.6 Megaproject

The definition of a megaproject is provided in the introduction to this chapter. It is, however, necessary to provide clarification of the terms 'industrial' and 'infrastructure' used in distinguishing between types of megaprojects in the research. It is also necessary to provide clarification of the terms private sector and public sector in the research.

Flyvbjerg (2014) reflected that megaprojects were increasingly used globally as the preferred project delivery method for the provision of goods and services. Typically, an agency or owner used a megaproject (as opposed to a group of large projects) to organise and finance the design, construction, operations, and maintenance services across a range of businesses and sectors (Flyvbjerg, 2014).

In South Africa the public sector typically delivers infrastructure megaprojects, while the private sector delivers industrial megaprojects. The category of infrastructure megaprojects in the South African context includes infrastructure projects with a profit motive. Examples of such infrastructure megaprojects are electricity generation projects (coal-fired and pumped-storage power generation), a multi-purpose pipeline, installation of a fibre-optic broadband network, tolled-road construction projects, a high-speed commuter rail network, and integrated bus rapid transit systems. All other capital-intensive mega-manufacturing projects typically delivered by the private sector are categorised as industrial megaprojects.

1.6.7 Project success

It was accepted that project success needed to be distinguished from project management success as was often found in the literature (Morris, 2013). It is thus confirmed that this research focuses on the success of the megaproject and not on the success of the functionality of project management during the implementation of the megaproject.

Various authors expressed the view that a project should not be evaluated only on the status of the project in terms of the 'triple constraint' or 'iron triangle' criteria at project closure. The future potential that it offered in achieving desired business objectives and generating new business or opportunities should also be considered (Pinto, 2004). Dvir, Lipovetsky, Shenhar and Tishler (1998), Kloppenborg, et al. (2009), Kloppenborg, Tesch, Manolis and Heitkamp (2006), the OGC (2007), Sewchurran and Barron (2008), Shenhar, Dvir, Levy and Maltz (2002) and Turner and Zolin (2012) support this view. In this context, Pinto (2004) described

the four dimensions considered relevant in measuring project success or failure as project efficiency, impact on the customer, business success, and future potential.

So far, the time-dependent dimension of delivering promised benefits over the longer term (as motivated by the cited authors) has not been visibly incorporated into the measures of success of a megaproject. The 'iron triangle' of delivering the promised benefits on budget and in time (Flyvbjerg, 2017, p. 11) still rules the discourse on project success – megaprojects included.

The criteria for the success or failure of megaprojects are accordingly limited in this research to the 'triple constraint' or 'iron triangle' notion of time, cost, and operational performance (promised benefits) as described by Merrow (2011). The reason for selecting the Merrow approach in the dissertation was essentially targeted at the evaluation and simplification of the project success component, as reflected in Figure 2.2.

The researcher did consider Hirschman's Hiding Hand (1967) perspective on failure and ultimate success. However, the arguments offered by Flyvbjerg and Sunstein (2015), namely the positioning of an alternative (malevolent) Helping Hand to Hirschman's benevolence perspective, and the lack of additional criteria other than schedule (planning) were found to be convincing enough not to include the Hirschman perspective in the dissertation.

The specifics of the criteria used for the research to measure project success, based on Merrow (2011), are as follows:

- The cost overrun should be less than 25% of the funds sanctioned for the project, normally done at the commencement of the execution phase of the project;
- The slip in the execution schedule of the project should be less than 25% of the duration promised to the approval entity (typically the board of the organisation) providing the funding for the project; and
- Production achieved should meet the planned production targets during the first two years of operation. This measure is seen as a proxy for the operability of the facility installed.

For the megaproject to be considered a success all three criteria needed to be met. If one of the criteria was not met then the project was considered a failure.

1.7 LIMITATIONS OF THE RESEARCH

It is normally expected with a study of this nature, and in fact with any study, that what it includes and excludes should be indicated specifically. A forward-looking explanation for some of the more material inclusions and exclusions in the research follows.

The research includes a multiple case-study approach incorporating six South African megaprojects from the private and the public sector. These projects were of an industrial or infrastructure nature and each had a distinct construction stage as part of its overall project lifecycle.

An appraisal of the attributes listed in the literature may suggest that a single individual was unable to fulfil the full spectrum of attributes. James, Rosenhead and Taylor (2013) and Remington (2011) shared the perspective that all the attributes were rarely found in one person. Similarly, De Klerk (2014) reflected that the list of recommended leadership characteristics and traits prescribed in the literature were unrealistically comprehensive and optimistic. The research identifies, within the broad array of attributes described by literature, those attributes that are important for the sponsor on a megaproject to possess.

These important attributes are further refined in the research to those that are essential for megaproject success. Argumentation is also provided on reducing the number of attributes required to the realistic minimum that should be expected of one individual.

It should be noted that the sponsor attributes found in literature were not specifically for megaprojects. There were, however, literature sources that did reflect on the inclusion of large or megaproject sponsors when attributes were discussed. These references included Helm and Remington (2005) and Remington (2011), in addition to the APM (2018). The research is accordingly premised on the assumption that the array of sponsor attributes identified from literature is inclusive of the megaproject perspective.

The research does not focus on the integrity of the processes supporting the appropriation of the funds (approved budgets) and timelines for the respective cases studied. The assumption was made that for every project there would be a quality assurance process within an organisation involved to protect the integrity of the estimates and timelines compiled and submitted for approval. The research does not attempt to confirm that the concept of 'optimism bias' (for costs to be expended, timelines to be met and benefits to be achieved), as presented by Flyvbjerg (2007, 2014) was appropriately taken care of.

From a cultural perspective the research does not attempt to quantify the impact of possible untowardness in an organisation regarding corruption, nepotism, fraud or bribery during the execution of its megaprojects.

The research investigates the role of the sponsor as leader and accordingly investigates the use of psychometric or other tests to determine the presence of leadership skills, as well as important and essential attributes, in the persona of a prospective sponsor. These actions are focused on providing guidance for executives responsible for the identification and appointment of sponsors on megaprojects.

1.8 CONCLUSION

As far as could be ascertained, the relationships between the attributes of megaproject sponsors, their effectiveness and project success have not been investigated before. This implies a shortcoming in guidance for executives responsible for the identification and appointment of sponsors on megaprojects.

By identifying the realistic minimum number of attributes required by sponsors on megaprojects, this research contributes to the sparse literature on this topic. Furthermore, it provides guidelines for executives and company boards who have to appoint sponsors on megaprojects.

Appointing an individual who possesses leadership skills, as well as most of the important and essential attributes, and ensuring that these attributes are effectively applied should positively influence the desired successful outcome of a project.

Bourne (2015) made a relevant comment on the governance process of nominating and appointing the sponsor. She stated that ‘...the era of the “accidental project manager” has largely passed, but we are still in the age of the “accidental sponsor”’. For all the cases studied, the sponsor’s identification and appointment should not be accidental. The research endeavours *inter alia* to ascertain if the formalisation thereof in terms of attribute assessment should be significantly improved.

1.9 CHAPTER OUTLINE

The layout of the dissertation is presented in Figure 1.4.

The research further unfolds with Chapter 2 of the dissertation providing the literature study and laying the foundation for an exploration of those important and essential attributes required by the sponsor to achieve project success. Contextually, the exploration revolves around a relationship between the personal attributes of the individual carrying out the role of sponsor and how they directly influence his/her effectiveness. The exploration also

revolves around the relationship between the effectiveness of the sponsor and its use as the single best predictor of project success or failure.

The literature explored in this chapter ultimately allowed the conceptual framework for the empirical research to be established. In essence, the framework consists of a number of propositions identified from the literature that are converted into research questions. These questions, when answered, provide the necessary data to achieve the research aim. The identification of both the important and essential attributes of the sponsor, and their effective application are targeted to lead to a higher probability of success for a megaproject.

The chapter also reflects the outcome of the interviews conducted for a pilot case study. The outcome of the pilot case study lays the foundation for the other case studies that provided practical guidelines for company boards to select and appoint sponsors.

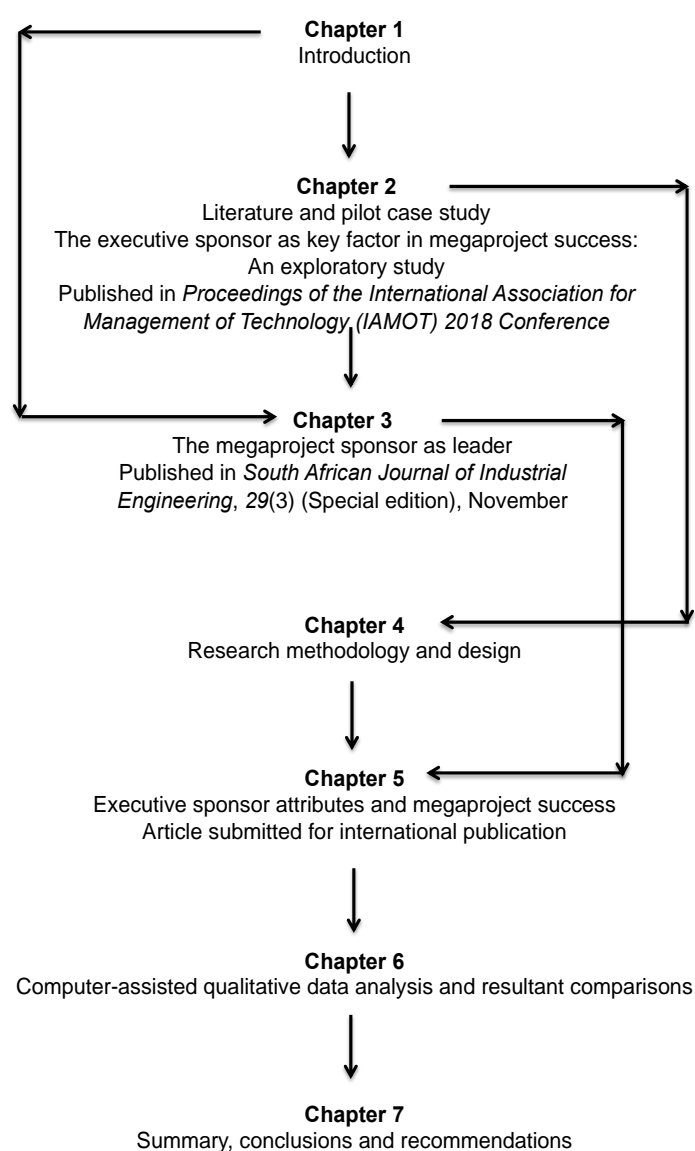


Figure 1.4: Layout of dissertation

This chapter was published as Louw, W., Steyn, H., Gevers, W. & Wium, J. (2018). The executive sponsor as key factor in megaproject success: An exploratory study. In B. Nunes, A. Emrouznejad, D. Bennett & L. Pretorius (Eds.), *Towards sustainable technologies and innovation: Proceedings of the International Association for Management of Technology (IAMOT) 2018 Conference*, April. Birmingham, United Kingdom: Operations and Information Management Group, Aston Business School, Aston University.

Chapter 3 confirms that the sponsor on a megaproject is primarily a leader who requires an ability to ensure continually that the project remains synchronised with the strategy of the business organisation. Because leadership is such a distinct component of the sponsor profile, it was considered appropriate to dedicate a separate chapter to it in the dissertation and not make it part of the literature review only.

This chapter uses leadership theories to identify instruments that can assist in the assessment of the leadership style and leader traits or attributes of a sponsor. It was found that the styles of transformational and charismatic leadership are the most appropriate for the megaproject sponsor. Both styles contain the ability to develop a vision for the project that is both sufficiently compelling and powerful to align those involved with the project.

In addition to the two leadership style assessment instruments, a number of assessment instruments were identified that can assist in identifying the leader traits and attributes of the sponsor. Collectively, a framework is proposed to identify assessment instruments for the leadership style and leader traits or attributes of a megaproject sponsor.

This chapter was published as Louw, W., Wium, J., Steyn, H., & Gevers, W. (2018). The megaproject sponsor as leader. *South African Journal of Industrial Engineering*, 29(3) (Special edition), November, pp. 173-187.

Chapter 4 provides a view on the research design and research methodology that formed the basis for the research. A multiple-case study approach was used. The research methodology included a pilot case study, semi-structured interviews using open-ended questions, a survey questionnaire and a focus group activity.

Six cases of megaprojects were identified that readily provided access for the researcher to senior and executive management of the owner organisations. The three key positions that the researcher obtained access to were the executive management responsible for the appointment of the sponsor, the sponsor, and the project manager who reported to the sponsor. Twenty-five interviews were conducted with 26 participants, accompanied by a survey questionnaire with the same participants. One interview was conducted with two interviewees jointly attending the interview. To ensure a balanced perspective, both

successful and failed megaprojects were included in the research. A focus group activity completed the process of primary data collection.

Chapter 5 commences the process of analysing and reporting on the perceptions of executives and senior managers (26 in total) who acted either as an executive manager responsible for the selection of a megaproject sponsor, a sponsor or a project manager. Semi-structured interviews utilising open-ended questions and a survey questionnaire were used. This was done to obtain both retrospective and real-time accounts from those participants who were experiencing, or had experienced the issue at hand i.e., attributes of the sponsor.

As indicated, the research methodology includes the use of a survey questionnaire for primary data collection. This chapter reports on the analysis of the survey questionnaires as it pertains to the identification of important and essential attributes.

The chapter reports on differences and commonalities as they relate to the identification of sponsor attributes between:

- Public and private sector projects;
- The views of executive management, sponsors, project managers; and
- Successful and failed projects.

Guidelines are provided for executives and company boards who have to appoint sponsors on megaprojects by identifying and categorising the attributes required.

This chapter has been submitted for publication in the *International Journal of Project Organisation and Management* as Louw, W., Wium, J., Steyn, H., & Gevers, W. Executive sponsor attributes and megaproject success.

Chapter 6 provides a comparison of the results from the survey questionnaire analysis with the results from the semi-structured interviews. Context is provided in the chapter on the decision to use qualitative content analysis to analyse the data that emanated from the semi-structured interviews.

The chapter also reports on differences and commonalities as they relate to the identification of sponsor attributes between:

- Public and private sector projects;
- The views of executive management, sponsors, project managers; and
- Successful and failed projects.

The resultant output of a process that merges the survey questionnaire and the interview data analyses is in turn compared with literature in the domain of sponsor attribute identification and selection. This comparison with literature is considered a third data-

analysis methodology in addition to the survey questionnaire and interview data analysis methodologies.

The final chapter, Chapter 7, provides an overview of the main findings of the research, the contribution of the research to knowledge and what implications these findings have for existing theory. An explanation is provided of the limitations of the research and how conclusions reached create an agenda for future research.

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CHAPTER 2

LITERATURE REVIEW AND PILOT CASE STUDY¹

2.1 INTRODUCTION

Megaprojects are defined as projects costing US\$1 billion or more. Reflecting on the success (and failure) of major projects, in 1987 Morris and Hough produced perhaps the seminal publication on these major (later to be referred to as mega-) projects (Dalscher, 2012). They stated that the track record of major projects at the time was fundamentally poor. This was particularly so for the larger and more difficult projects, which were often completed late or over budget, did not perform in the way expected, and appeared to be failures in the view of the public. Having these projects fail at a concerning and unsustainable rate was problematic for the funders who made very large sums of money available. It was also problematic for the societies in which they were being carried out, and for the health of the global economy.

Flyvbjerg, Bruzelius and Rothengatter (2003) and Miller and Lessard (2001) identified the key issue in the success or failure of a megaproject to be the sponsor. In particular, the role of the sponsor was found to be critical in influencing the progress and outcome of a megaproject.

A number of industrial and infrastructure projects in excess of ZAR10 billion/US\$1 billion have been completed in South Africa since the year 2000. The failure rate of these South African megaprojects probably does not differ much from the typical global figure of 65% or more (Merrow, 2011). Within this context, the chapter reflects on the literature and elaborates on the relationship between the role of the sponsor, the effectiveness of the role and the personal attributes required in performing the role. Initial indications from the literature are that the personal attributes of the sponsor directly influence his/her effectiveness of that role. This has a significant bearing on the success of the megaproject.

Identifying both the important and essential sponsor attributes related to the success of megaprojects is intended to contribute to an increase in the likelihood of these projects' success. Identification of both the important and essential sponsor attributes, and increasing

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the level of success of megaprojects, will potentially contribute not only to the health of the South African economy, but also to the health of the economy of the African continent.

Although several authors indicated the central role of the executive sponsor in the success or failure of megaprojects, there was no guide to identifying the attributes of the executive sponsor, nor had the effect of the sponsor on megaproject success been studied sufficiently.

This is the first of two papers exploring the attributes of the sponsor that determine the sponsor's effectiveness and ultimately result in the success of the megaproject. The paper commences with the definition of a megaproject, describes the types of megaprojects, and depicts the role players in megaprojects. Thereafter the success or failure of megaprojects is defined. It is followed by a description of the executive sponsor, elaborating on this role, its accountabilities and responsibilities, and clarifying how the role changes during the megaproject lifecycle. Next, the research methodology and the pilot case study are discussed. Prior to the concluding summary, the key issues of the attributes of the sponsor, and how the sponsor is selected, are discussed.

2.2 MEGAPROJECTS

2.2.1 Definition

A megaproject is defined as any project with a total capital cost (materials, engineering, and construction labour costs associated with completing a project) equal to or in excess of US\$1 billion at the 1 January 2003 dollar value (Davies, Dodgson, Gann & MacAulay, 2017; Flyvbjerg, 2014; Ghosh, Williams, Askew & Mulgund, 2012; Irimia-Dieiguez, Sanchez-Cazorla & Alfalla-Luque, 2014; Merrow, 2011). Flyvbjerg (2014, p. 6) defined megaprojects as 'large-scale, complex ventures that typically cost US\$1 billion or more, take many years to develop and build, involve multiple public and private stakeholders, are transformational, and impact millions of people'. It appeared that the nominal value of US\$1 billion has not changed since 2003, as it continues to be used to define the term 'megaproject'.

For the purpose of this study (for the period 2006 to 2016) a megaproject was defined as a project with a value equal to or in excess of ZAR10 billion equating to US\$1 billion. This figure was based on the US\$/ZAR exchange rate for the period 2006 to 2016. The period was arrived at as a reasonable and representative time frame, given the completion (or near-completion) of a number of industrial and infrastructure megaprojects in South Africa. Clarification of the terms 'industrial' and 'infrastructure' follows.

2.2.2 Types of megaprojects

Flyvbjerg (2014) reflected that megaprojects were increasingly used globally as the preferred project delivery method for the provision of goods and services. Typically, an agency or owner used a megaproject (as opposed to a group of large projects) to organise and finance the design, construction, operations, and maintenance services across a range of businesses and sectors (Flyvbjerg, 2014).

In South Africa the public sector typically delivers infrastructure megaprojects, while the private sector delivers industrial megaprojects. The category of infrastructure megaprojects in the South African context includes infrastructure projects with a profit motive. Examples of such infrastructure megaprojects are electricity generation projects (coal-fired and pumped-storage power generation), a multi-purpose pipeline, the installation of a fibre-optic broadband network, tolled-road construction projects, a high-speed commuter rail network, and integrated bus rapid transit systems. All other capital-intensive mega-manufacturing projects typically delivered by the private sector are categorised as industrial megaprojects.

2.2.3 Role players/ stakeholders

In an organisational context, project sponsorship is considered a critical and pivotal component in an organisation's governance of project management (APM, 2009; Labuschagne, Cooke-Davies, Crawford, Hobbs & Remington, 2006; Morris, 2013). In the same context as Labuschagne et al. (2006), the APM (2009) portrayed the links that the project sponsor had with other key parties within a generic structure, illustrated in Figure 2.1. This structure, very similar to the model developed by Labuschagne et al. (2006), needed to be read within the context that:

- Vertically down, the sponsor defined the purpose and objectives of the project, provided decisions and resources, and directed the project manager;
- Horizontally, the sponsor provided key communication with internal and external stakeholders and monitored the project context; and
- Vertically up, the sponsor reported on the business case of the project and the realisation of its benefits (both of which are the responsibilities of the sponsor).

The APM (2009) also provided perspective on the sponsor within a programme. A programme was described as a collection of projects with shared goals and objectives, and whose predicted benefits had to materialise as a whole for the programme to be successful (Morris, 2013).

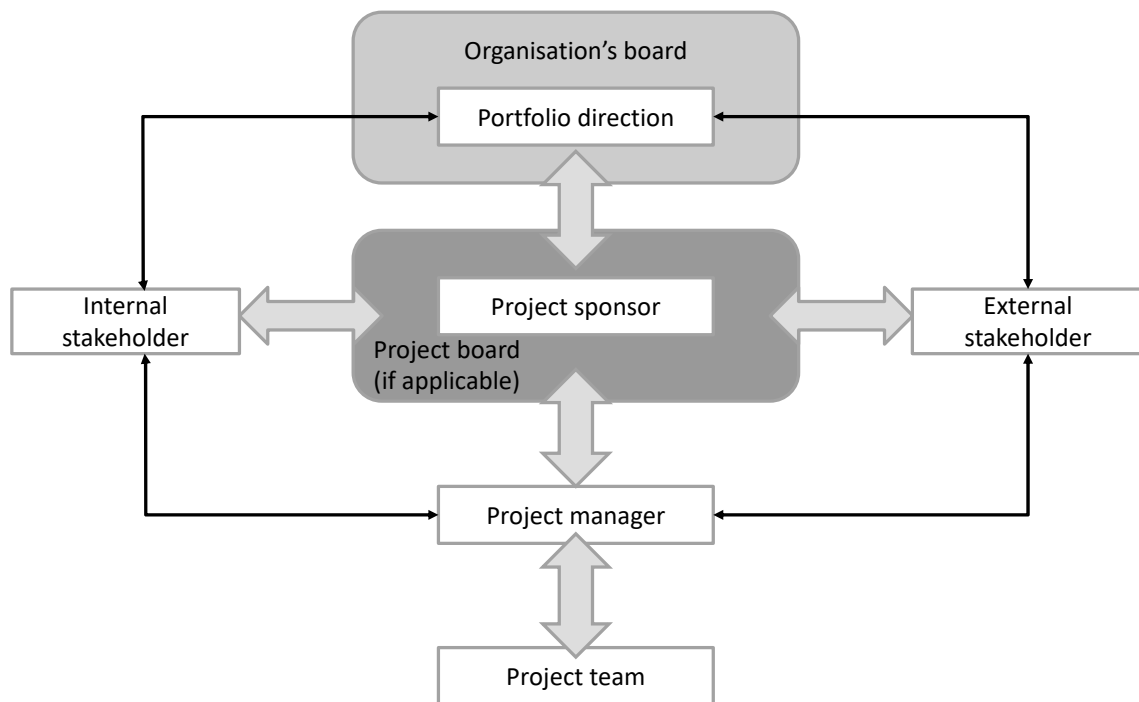


Figure 2.1: Generic organisational context

Source: APM, 2009, p. 3

2.2.4 Success or failure

In the search for project success criteria, the literature reflected those listed in Table 2.1.

Dvir et al. (1998) and Shenhar et al. (2002) agreed on very similar project success dimensions that, to date, have not developed significant traction.

Turner in Turner and Müller (2004) merged the work of Wateridge (1995) and Morris and Hough (1987) on success criteria for large (read mega-) projects, and produced a list of success criteria. Turner and Müller (2006) recognised that various stakeholders would have an interest in the criteria, and would express their opinion on success or failure at different times. Turner suggested that a balanced view of what constitutes 'success' needed to be negotiated between all stakeholders.

Merrow (2011) indicated that 65% of industrial megaprojects failed to meet business objectives (cost, schedule and operability), and so defined success as 'a lack of failure'. He stated that the failure rate in some industrial sectors was as high as 78%. If a project performed worse than the threshold on any of the five criteria as used by Merrow (2011) shown in Table 2.1, it was classified as a failure. If a project did not experience any one of the five dimensions as a problem, it was classified as a success.

Table 2.1: Project success criteria as reflected by various authors

Authors	Project success criteria
Dvir, Lipovetsky, Shenhar & Tishler (1998)	<ul style="list-style-type: none"> - Meeting design goals*; - Benefits to the customer*; - Benefits to the developing organisation; and - Benefits to the national infrastructure. <p>* Of the above four dimensions, these two are considered more important than the others.</p>
Shenhar, Dvir, Levy & Maltz (2002)	<ul style="list-style-type: none"> - Project efficiency; and - Impact on the customer. - Business success; and - Preparing for the future.
Morris & Hough (1987); Turner & Müller (2006); Wateridge (1995) in Turner & Müller (2004)	<ul style="list-style-type: none"> - Increases shareholder value. - Makes profit for the owner. - Satisfies owner and sponsor. - Satisfies consumers. - Satisfies users and champion. - Achieves purpose. - Meets specifications: <ul style="list-style-type: none"> - Functionality; and - Flexibility, reliability, availability, maintainability, elasticity, security. - Time, cost, quality. - Satisfies project team. - Makes a profit for the contractor.
Merrow (2011)	<ul style="list-style-type: none"> - Cost overrun (< 25%). - Cost competitiveness (< 25%). - Slip in execution schedule (< 25%). - Schedule competitiveness (< 25%). - Production versus plan (operability) – meeting production targets in first two years.
Flyvbjerg (2014, 2017)	<ul style="list-style-type: none"> - Meeting of budget (cost target); - Meeting of schedule (time target); and - Achieving business benefits. <p>Targets and benefits are those promised to entity that sanctions funding required for project.</p>

Flyvbjerg (2014, 2017) stated that, based on the evidence, about 10% of megaprojects were on budget, about 10% were on schedule, and about 10% delivered the promised business benefits. The percentage allowance in the thresholds advocated by Merrow (2011) was not evident in Flyvbjerg's analysis. By default, the implication is that 0,1% (one in a thousand) of megaprojects were a success, where 'success' is defined as meeting the targets in all three dimensions. Flyvbjerg acknowledged this to be an extreme position. Flyvbjerg et al. (2003) and Flyvbjerg (2014) referred to the failures as part of the 'megaproject paradox'. On the one side of the paradox there was a significant demand for megaprojects as the delivery model for ventures (within both the private and the public sector). On the other side was the very

poor delivery performance of megaprojects when assessed in terms of budget, schedule, and business benefit deviations.

Various authors expressed the view that a project should not be evaluated only in current terms. The future potential that it offered in achieving desired business objectives and generating new business or opportunities should also be considered (Pinto, 2004). Dvir et al. (1998), Kloppenborg, Manolis and Tesch (2009), Kloppenborg, Tesch, Manolis and Heitkamp (2006), the Office of Government Commerce (OGC) (2007), Sewchurran and Barron (2008), Shenhar et al. (2002) and Turner and Zolin (2012) supported this view. In this context, Pinto (2004) described the four dimensions considered relevant in measuring project success or failure as project efficiency, impact on the customer, business success, and future potential. So far, the time-dependent dimension of delivering promised benefits over the longer term (as motivated by the cited authors) has not been visibly incorporated into the measures of success of a megaproject. The 'iron triangle' of delivering the promised benefits on budget and in time (Flyvbjerg, 2017, p. 11) still rules the discourse on project success – megaprojects included.

It should, however, be noted that an alternative model of the reasons for cost overruns in megaprojects to that propagated by Flyvbjerg (2008, 2014) has been developed during the last number of years. The Flyvbjerg model positioned optimism bias and strategic misrepresentation as the leading reasons for megaproject cost overruns. The alternative model stressed the importance of the properties of the projects, leadership and the organisational structure of the project. It also emphasised project management complexities, project needs (both in terms of people and technical) and technology needs (Olaniran, Love, Edwards, Olatunji & Matthews, 2015).

Advocates of the alternative model such as Love, Ika, Ahiaga-Dagbui, Ackermann and Olaniran argued that the reasons for cost overruns as advocated by Flyvbjerg had not been substantiated by empirical data and were therefore not conclusive. They also argued that certain aspects, such as deficiencies, in methods and approaches adopted for research into the majority of cost overruns existed.

One of these deficiencies raised was a poor understanding of the application of system dynamics and the embedding thereof in the discussion on sources of cost overruns not being in place. They further argued that causality in a demonstrable form was lacking and that the design of the research done on the matter had been superficial (Ahiaga-Dagbui, Love, Smith & Ackermann, 2017). Olaniran et al. (2017) suggested that significant shifts in paradigm and methods could be required to fully understand the nature and sources of cost overruns.

The criteria for the success or failure of megaprojects are accordingly limited in this dissertation to the ‘triple constraint’ notion of time, cost, and operational performance (promised benefits) as described by Merrow (2011)². This is done in order to simplify the evaluation of the project success component reflected in Figure 2.2 later in the dissertation.

Table 2.2 reflects the views of various authors on the success or failure rates of megaprojects and the impact of sponsors on these rates. However, none of the authors in Table 2.2 referred to the impact of the sponsor. Table 2.3 lists some references to projects in general (not necessarily megaprojects).

It is clear from Table 2.2 that many more megaprojects failed than were successful. Flyvbjerg et al. (2003) and Flyvbjerg (2005) also supported this finding. As indicated in Table 2.3, in the overall spectrum of projects (i.e., not necessarily megaprojects), the situation was noticeably the opposite; and the relatively high percentage of successes was largely ascribed to projects with active sponsors.

Table 2.2: Overall spectrum of success or failure rates of megaprojects

Reference	Project failure rates ranges (%)
Merrow (2011)	Range of 65 to 78%
Merrow in Westney, Evans & Tsai (2013)	Range of 67 to 80% (Industrial projects that cost more than US\$1 billion have only a one-in-three chance of achieving completion within 125% of budget. In some industries, such as oil and gas, it is even worse, as the probability of failure is closer to four-in-five.)
Ernst and Young (n.d.)	64% face cost overruns; 73% report schedule delays (specifically megaprojects in oil and gas industries).
Flyvbjerg (2014)	90% overruns on cost (budget), time delays (schedule) and not meeting promised benefits. No thresholds were provided as in the Merrow (2011) reflection.

² For the majority of the six case study projects the budgets and schedules used for the final investment decisions were determined based on the completion of a completed concept or basic engineering package. For specifically the private sector projects the contingency amount included in the budget made provision not only for a contingency reserve but also a management reserve. A similar approach was followed for the determination of a realistic schedule. Taking this into account it was possible to rationalise a meaningful assessment of the success or failure of the megaprojects considered.

Table 2.3: Overall spectrum of success or failure rates of projects in general

Reference	Project failure rates ranges (%)
Project Management Institute (PMI) (2012): Overall spectrum of projects (not necessarily megaprojects)	Range of 25 to 36% For organisations that have active project/programme sponsors, at least 80% of their projects have a success rate of 75%.
PMI (2013): Overall spectrum of projects (not necessarily megaprojects)	26% Specifically related to the practice 'Have active sponsors on 80%+ of projects'

2.3 EXECUTIVE SPONSOR

2.3.1 Definition

In defining the terminology around 'sponsor' and 'sponsorship', significant work has been done by Crawford, Cooke-Davies, Hobbs, Labuschagne, Remington and Chen (2008a, 2008b) who reviewed a number of national and organisational standards for project management. The standards reviewed were those developed by the PMI, the International Project Management Association (IPMA), the Association of Project Management (APM), and the OGC in the United Kingdom.

Despite an inconsistency between the four standards mentioned above on how the role of the sponsor was carried out (e.g. by either an individual or a group), the similarities were quite clear, and five key themes emerged. The sponsor was:

- At a senior level in the owner (a.k.a. client or customer) organisation;
- In a role involving substantial dimensions of leadership (as opposed to being just a management role);
- Responsible for ensuring that an effective governance framework was created for the project;
- The owner of the business case for the project, and ultimately responsible for the delivery or realisation of the benefits projected within the business case; and
- Positioned structurally on the interface between the owner and project organisations. This positioning enabled decision-making and support for the project manager, particularly for issues beyond the control of the project manager.

2.3.2 Role of the sponsor

2.3.2.1 Perspectives

Morris (2013, p. 146) stated that the conduct of the sponsor 'can arguably make him the single most influential "actor" on the project, with a disproportionately high impact on outcome success'.

The APM (2009, pp. vii, 4) took an even broader view of the role of the sponsor: It stated that the role was pivotal to the governance of project management and the broader ongoing success of organisations. Bourne (2015, p. 125) was of the view that senior stakeholder support, specifically from the sponsor, was key to project success. However, Bourne was concerned about how the sponsor was identified for the project. Bourne's opinion was that '...the era of the "accidental project manager" has largely passed, but we are still in the age of the "accidental sponsor"'.

Barshop (2016) viewed the sponsor as the one person accountable for the value to be delivered by the project. He emphasised that this was a leadership role. Turner and Müller (2006) stated that sponsor engagement was decisive for project success, and that sceptical and involved sponsors had more successful projects.

The guidance provided by the APM (2009) on the role of the sponsor vis à vis stakeholders was very sponsor-centric, as shown in Figure 2.1. By contrast, Lehtinen, Aaltonen and Rajala (2017) were of the opinion that managing stakeholders in megaprojects was not in the hands of a single organisation that has a dyadic relationship with the stakeholders. Neither did Lehtinen et al. (2017) make any reference to the role of a sponsor in managing stakeholder relationships on a megaproject. This raised a question about the importance of the sponsor concept within the Finnish environment.

Nicholas and Steyn (2017) argued that every project required the support of a champion and a sponsor. Their view was that the champion (with positional power) strongly believed in the project, and was an individual with the ability to convince the stakeholder community of the project's intended value or benefits. The sponsor was described as an individual who focused on ensuring that the project was given the appropriate priority. The sponsor also obtained the required resources, both capital and human. He/she was influential, performed - in a formal capacity - the role of clearing away barriers, and was able to influence the decisions of the executive management in the (permanent) organisation. Their view was that the sponsor normally did not spend too much time on the project, but was available for the project manager, e.g. when in need of top-level assistance. The PMI (2012, 2013) did not agree with the 'time spent' perspective of Nicholas and Steyn. The PMI view emphasised the relationship between project success and active sponsors. Remington (2011) also accentuated the need, particularly within a megaproject context (which is, by nature, complex), for the sponsor role to be played on a dedicated basis. Barshop (2016) believed that if a project was to be used to establish a new business environment, it would in all likelihood be allocated a full-time sponsor who, at the highest appropriate level, would oversee the project work, be involved in commercial negotiations, and direct the creation of the business and operating organisations.

In more recent project management literature, such as the APM (2018) and Barshop (2016), it was *inter alia* stated that the sponsor championed the sponsorship role, and that the sponsor championed the development of relationships across the project. It therefore appeared that the roles and responsibilities of the modern-day sponsor had started to usurp the role and responsibilities the champion was initially intended to perform.

Markham and Aiman-Smith (2001) defined the champion as an individual who recognised a new technology or market opportunity as having significant potential, adopted the project as his/her own and committed personally to the project. The champion also generated support from other people in the organisation and advocated vigorously for the project.

The role of a champion was described as informal, overlapping with the formal role of the individual. Markham and Aiman-Smith (2001) stated that a critical contribution of the champion was to generate support for the project from other people throughout the organisation.

The APM (2018) provided an extensive description of what the sponsor did for both the business and the project manager. Included in this description were champion role facets such as fulfilling a formal role and being considered as dedicated and personally committed to the project. This aspect was regarded as distinctly preferable in the case of a megaproject.

Taking personal ownership of the project and convincing the board of the value of investing in the project through a compelling vision and a project business case overlapped between facets described for the sponsor and the champion (API, 2018). The sponsor placed the realisation of the desired project benefits at the core of what he/she needed to deliver.

The APM (2018) listed the facets of recognising opportunities to increase the return on investment of the project and to create confidence in the board to act on such opportunities decisively as part of the role of the sponsor. The APM (2018) further stated that these examples continued to indicate that the sponsor role had usurped that of the champion.

The sponsor periodically presented the project to review panels and stakeholder groups to promote understanding and agreement for decisions made and also promoted the project to senior governance panels to satisfy the board and senior stakeholders that the benefits would be realised. This was indicative, according to the APM (2018), of the sponsor supporting the project using his/her wider influence within the organisation – yet again an example of the role of the champion being usurped by that of the sponsor.

Whilst working with other stakeholders to ensure their support for the successful delivery of the project, the sponsor personally developed relationships with those senior stakeholders

who could influence successful delivery. He/she championed relationship development across the project. The APM (2018) made specific reference to the functionality of the champion within that of the sponsor. Another such acknowledgement was that the sponsor acted as the champion for the project in its broader context by maximising organisational and external support for the project.

Finally, the sponsor defined what success looked like and owned the requirements against which the project needed to deliver. He/she ensured prompt escalation to the appropriate governance level of issues that the project manager and project team were not able to deal with. The APM (2018) concluded that he/she then championed the resolution of such issues. What was not implicitly stated by the APM (2018) was that the sponsor should be able to recognise a market opportunity as having significant potential and then promote the project very strongly.

From the above it was clear that the role of the sponsor, as described by literature (APM, 2018; Barshop, 2016; Bryde, 2008), replaced the role of the champion through the multiple champion facets contained in the role of the sponsor. Bryde (2008) and Pinto and Patanakul (2015) stated that the championing dimensions described *inter alia* by Markham and Aiman-Smith (2001) were important behaviours for the sponsor of a project to possess.

Although Pinto and Patanakul (2015) indicated that the terms 'champion' and 'sponsor' were sometimes used interchangeably, other researchers have suggested that the championing behaviour was a responsibility that the sponsor needed to assume. For the purpose of the research, the researcher decided to view championing behaviour as part of the sponsor role (as supported by the literature discussed above).

2.3.2.2 Responsibilities and accountabilities

Where the sponsor or sponsorship was addressed in the project management literature, it was comprehensively recognised that the sponsor role was a crucial component of any project. It was also recognised that the sponsor made a significant contribution to the success or failure of the project (APM, 2009; Barshop, 2016; Bourne, 2015; Bryde, 2008; Bucero & Englund, 2007; Cooke-Davies, 2005; Cooke-Davies, Crawford, Hobbs, Labuschagne & Remington, 2006; Crawford et al., 2008a, 2008b; Crawford & Cooke-Davies, 2005; Englund, 2010; Englund & Bucero, 2006; Helm & Remington, 2005; James, Rosenhead & Taylor, 2013; Pacelli, 2005; Sutterfield, Friday-Stroud & Shivers-Blackwell, 2006; Turner & Müller, 2006; Kloppenborg et al., 2009; Kloppenborg & Tesch, 2015; Kloppenborg, Tesch & Manolis, 2011; Morris, 2013; PMI, 2014; Remington, 2011; Van Heerden, Steyn & Van der Walt, 2015; West, 2010).

The PMI (2014) stated that executive sponsors were primarily allocated to initiatives of strategic importance that were complex, carried a certain degree of risk, were clearly discernible, and were allocated a very sizeable budget. A megaproject was thus entitled to a sponsor from the executive (most senior) ranks of an organisation. For the remainder of this paper, any reference to a sponsor should be interpreted as meaning an executive sponsor.

In the national (United Kingdom's) and organisational standards for project management, no single standard definition of the role of the sponsor was provided. There was, however, general (albeit implied) agreement that the sponsor or sponsorship role may be carried out by an individual or a group of people, such as a sponsoring group, project board, executive committee or steering committee.

In addition to the OGC United Kingdom standards, Crawford et al. (2008a, 2008b), Remington (2011) and Nicholas and Steyn (2017) were quite specific, in their reflections on individual versus group sponsorship, that there was clearly a place for group sponsorship in the sponsor/sponsorship context. They posited that the governance board for a programme (a committee of senior managers) contained a number of roles and responsibilities. Among them, the board (at a summarised level) was responsible for strategic alignment, oversight, providing direction and the creation of an enabling environment for the programme.

Bryde (2008) stated specifically that the predominant trend in the literature was to conceptualise a project sponsor from the perspective of an individual. In addition to Bryde (2008), the use of and reference to the sponsor as an individual was identified in the work of the APM (2009), Barshop (2016), Bourne (2015), James et al. (2013), Morris (2013), the majority view of the PMI (2014), Van Heerden et al. (2015) and West (2010). The position in this paper, therefore, is that an individual performs the sponsorship role.

In order to broaden the understanding of the roles, responsibilities or accountabilities of the project sponsor, the following approach was adopted.

An initial assessment (to test for duplication) was performed on the descriptors of the roles, responsibilities or accountabilities identified and used by the following authors or publications: APM (2009); Barshop (2016); Crawford et al. (2008a, 2008b); Englund and Bucero (2006); James et al. (2013); Kloppenborg and Tesch (2015); Morris (2013); Nicholas and Steyn (2017); PMI (2014); Van Heerden et al. (2015) and West (2010).

The term 'responsibilities' was adopted, as it was found to be the most prevalent term in the literature. The work by Crawford et al. (2008a, 2008b) was used as a basis to begin the process of developing a broad framework for sponsor responsibilities, given below. An asterisk (*) indicates where a clear congruence in the use of the term 'accountability' was found between authors or publications.

- A senior management role representing the interests of the client (also described as the owner) at the interface between the client and project organisations;
- Owning the (robust) business case of the project, driving the realisation of its intended benefits, and recommending cost/benefit opportunities*;
- Providing direction by, among other things, developing a vision for the project, ensuring alignment of the project with company strategy, and building project team commitment to the project*;
- Establishing values, and creating a value-based culture and environment that ensures success*;
- Managing barriers or problems outside the remit and control of the project manager, to ensure the capture of the intended project value*;
- Giving direction and clarifying the framework for effective governance*;
- Setting performance standards (typically via the project charter) and establishing priorities at both organisational and project level;
- Developing and maintaining internal and external interfaces with the project outside the remit of the project manager, including relationships with the full spectrum of stakeholders;
- Selecting and appointing the project manager;
- Being a coach and mentor for the project manager, and in doing so, supporting the project manager and project team in overcoming obstacles;
- Enabling the provision of resources (financial, people or other) in support of the project manager;
- Giving direction and clarifying the framework for effective decision-making;
- Giving direction and clarifying the framework for adequate and effective communication;
- Selling (promoting or defending) the project to senior management and other stakeholders;
- Giving direction and clarifying the framework for effective planning (including schedule, budget, resource plan, communication plan, risk management plan, change control process, escalation process, and periodic review structure);
- Ensuring quality for the project by also covering the key stakeholders in addition to the board and the project manager (e.g. assurance reviews, providing feedback, follow-up and corrective actions, and identifying and capturing lessons learned); and
- Assessing progress and (with the project manager) governing risks to ensure that the business case is appropriately protected.

2.3.2.3 Role changes over the project lifecycle

For the research the reference to the project lifecycle was very similar to the sequences as described by:

1. Morris (2013, p. 150), namely concept, feasibility, design, execution, hand-over and commissioning, and operations and maintenance; and
2. Merrow (2011, p. 24), namely front-end loading 1/ business planning, front-end loading 2/ facilities planning, front-end loading 3/ execution planning, execute, start-up and hand-over, and operate.

Both Morris and Merrow included three distinct stages in their models, namely front-end, execution, and start-up and operations.

During the front-end phase of a typical project (including a megaproject), the development of the business case is the key focus. The project thus needs to be viewed first from a 'becoming' and then from a 'being' perspective as the project lifecycle unfolds (Morris, 2013). In an ontological context, the project changes from a post-modernism to a realism perspective. The nature of the project changes from a strategic deliberation or developmental orientation (front-end) to a focussed delivery orientation (execution).

The front-end is the phase of the project in which the sponsor plays the most critical role. This implies that there is a need for the selector of the sponsor to be aware of and sensitive to the sponsor's attributes. This is particularly pertinent to the ability of the individual to accommodate both post-modernism and realism within his/her philosophical approach to the project.

Morris (2013, p. 236) stated that if the scope of the Management of Projects (MoP) concept was enlarged to include the (project) management of the front-end, then the realist ontology of the individuals in the project needed to change. It would change the 'essence' of the (project management) discipline. This implied that the project manager would have to enhance his/her understanding of the concepts of purpose, scope, ethos and definition (the world of 'becoming') whilst performing the project manager role. The fact that the project manager would then enter the front-end domain required the development of a richer ontology than project management provided when it was viewed predominantly as an execution-oriented discipline (Morris, 2013, p. 237).

The inclusion of the project manager in the front-end domain of the project lifecycle posed a challenge for the sponsor. The challenge was to identify and appoint individuals with ontological approaches as project managers, who would be able to migrate seamlessly from a 'becoming' to a 'being' reality as the project lifecycle unfolded. This challenge held for both the Morris and Merrow project lifecycle perspectives.

2.3.3 Attributes of the sponsor

While assessing the responsibilities or accountabilities of the sponsor, a consistent two-part theme was identified. For the first part, it was found that the effectiveness of the sponsor was the single best predictor of project success or failure (APM, 2009). In the second part, it was found that the personal attributes of the individual carrying out the role directly influenced his/her effectiveness (APM, 2009; Barshop, 2016; Bucero & Englund, 2007; Crawford et al., 2008a, 2008b; Englund & Bucero, 2006; Helm & Remington, 2005; Morris, 2013; PMI, 2014; Remington, 2011; Van Heerden et al., 2015; West, 2010). The relationship between the attributes of the sponsor, the effectiveness of the sponsor, and project success can be seen graphically in Figure 2.2.

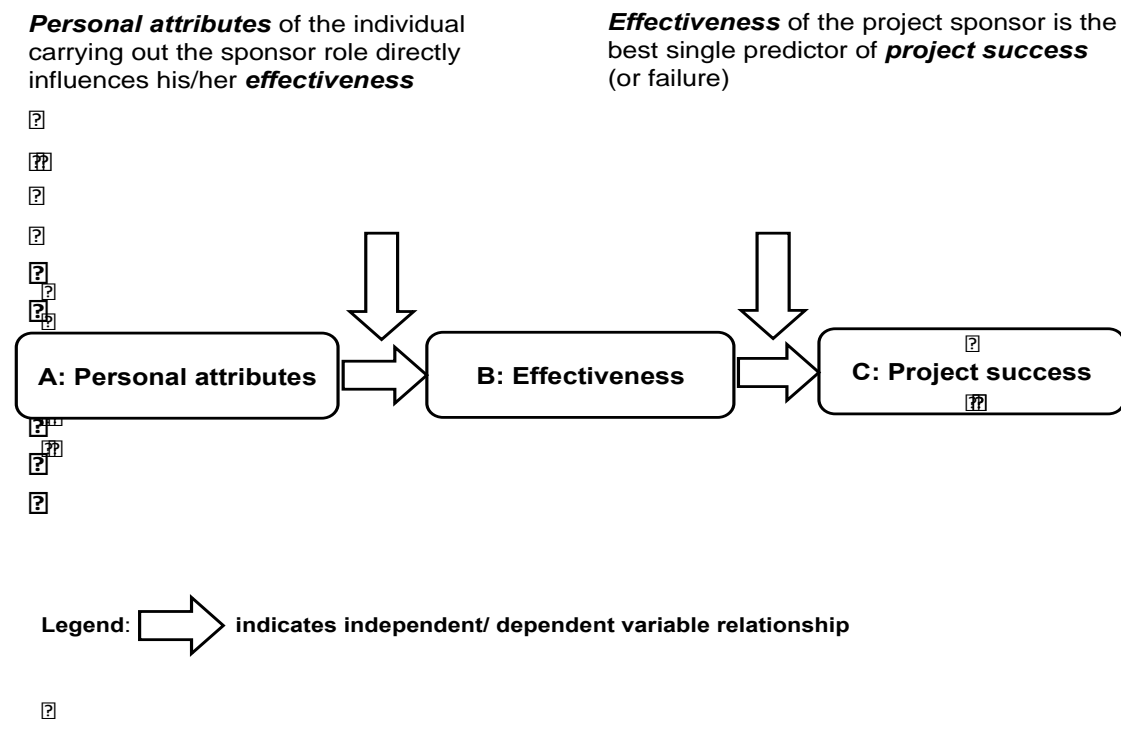


Figure 2.2: Relationship between personal attributes, sponsor effectiveness and project success

The essence of the relationship is that A (the personal attributes of the sponsor) is an independent variable of the dependent variable B (sponsor effectiveness). In turn, B (sponsor effectiveness) is an independent variable of the dependent variable C (project success).

In the context of attributes, it was found that different descriptors were used to describe what was inherent to the sponsor's effectiveness. For the purpose of simplicity and consistency, it was decided to use the term 'attributes'. This was supported by the fact that the work by Helm and Remington (2005), which used the descriptor 'attributes', was also cited by Cooke-

Davies et al. (2006), Kloppenborg et al. (2009, 2011), Labuschagne et al. (2006), Sutterfield et al. (2006) and Walker (2012).

The broad framework for the attributes of a project sponsor was developed as follows. An initial assessment to test for duplication was performed on the descriptors of the attributes identified and used by the following authors: APM (2009); Barshop (2016); Bourne (2015); Crawford et al. (2008a, 2008b); Englund and Bucero (2006); Helm and Remington (2005); Morris (2013); Pacelli (2005); PMI (2014); Remington (2011); Van Heerden et al. (2015); and West (2010). The work by Helm and Remington (2005) was used as the basis to begin the process of developing a broad overarching framework for sponsor attributes. The summarised array of attributes identified for inclusion in the broad framework is given in Table 2.4.

An appraisal of the attributes listed in the broad framework may suggest that an individual was unable to fulfil the full spectrum of attributes. Remington (2011) supported this perspective with the additional comment that the right teams could fulfil all the attributes. James et al (2013) shared this perspective that all the attributes were rarely found in one person. Similarly, De Klerk (2014) reflected that the list of recommended leadership characteristics (read attributes) and traits prescribed in the literature were unrealistically comprehensive and optimistic.

Table 2.4: Summarised broad framework for sponsor attributes

Type of attribute	Examples of and references to attributes
Strategic inclination	<ul style="list-style-type: none"> - Understanding of strategy of organisation, appreciation of how project contributes to corporate strategy (West, 2010). - Political knowledge of organisation, being politically savvy (Crawford et al., 2008a, 2008b; Helm & Remington, 2005; Van Heerden et al., 2015). - Understanding role, its significance, and need to align project with interests of organisation (APM, 2009). - Ability to provide clarity of direction (including development of compelling vision) within context of strategy and governance arrangements of organisation (APM, 2009; Bucero & Englund, 2007; Englund & Bucero, 2006).

Type of attribute	Examples of and references to attributes
Leadership	<ul style="list-style-type: none"> - Ability to lead for results and success by conveying sense of urgency and focusing on what matters most (Bucero & Englund, 2007; Englund & Bucero, 2006). - Ability to provide leadership consistent with culture and values of organisation (APM, 2009). - Ability to take holistic view and engage peers in organisation for advice and support for key decisions¹ (Barshop, 2016; Remington, 2011; West, 2010). - Ability and willingness to provide objectivity to project team and challenge project assumptions (including exploring alternatives to maximise value)¹ (Barshop, 2016; Helm & Remington, 2005; Remington, 2011; Van Heerden et al., 2015). - Ability to demonstrate credibility, i.e., being accepted by the organisation and stakeholders as suitable for the role (APM, 2009, 2018; Crawford et al., 2008; Helm & Remington, 2005; Van Heerden et al., 2015). - Possesses personal power, i.e., ability to influence others where the source of influence resides in the person instead of being vested by the position he/she holds (BusinessDictionary, n.d.)
People-focused (includes delegation, partnering, motivation, negotiation, tenacity, communication, decision-making and networking) ²	<ul style="list-style-type: none"> - Ability to delegate authority to appropriate levels, provide ad-hoc support to project team rather than micromanage¹ (Crawford et al., 2008a, 2008b; Helm & Remington, 2005; Remington, 2011). - Willingness to partner with project manager and team to deliver project objectives¹ (Remington, 2011). - Good negotiation skills and courage in context of providing, securing or battling for availability of resources for project manager (APM, 2009; Barshop, 2016; Bourne, 2015; West, 2010). - Tenacity to break down barriers (West, 2010).
Dealing with ambiguity and complexity	<ul style="list-style-type: none"> - Interpersonal and critical thinking skills, including ability to handle ambiguity when dealing with complex projects¹ (Barshop, 2016; Crawford et al., 2008a, 2008b; Helm & Remington, 2005; Remington, 2011; Van Heerden et al., 2015).
Motivation ²	<ul style="list-style-type: none"> - Ability to engage, willing to take personal ownership, acting in long-term interest of organisation (APM, 2009). - Ability to motivate when pressure mounts¹ (Remington, 2011). - Ability to motivate team to deliver vision (Crawford et al., 2008a, 2008b; Helm & Remington, 2005).
Communication ²	<ul style="list-style-type: none"> - Ability to demonstrate high-level communication skills¹ (Crawford et al., 2008a, 2008b; Helm & Remington, 2005; Remington, 2011; Van Heerden et al., 2015). - Ability to foster an atmosphere of trust and open communication with project manager and team (Barshop, 2016; Bucero & Englund, 2007; Englund & Bucero, 2006).
Open to learning	<ul style="list-style-type: none"> - Ability to exhibit high capability for self-reflection, willing to engage experts in problem-solving¹ (Remington, 2011). - Ability to promote knowledge creation and re-use (Barshop, 2016; Bucero & Englund, 2007; Englund & Bucero, 2006).
Networking ²	<ul style="list-style-type: none"> - Ability to develop and foster (high-level) effective connections between and within organisation and project team¹ (Bourne, 2015; Helm & Remington, 2005; Remington, 2011; Van Heerden et al., 2015). - Ability to demonstrate personal compatibility with other key players in organisation¹ (Crawford et al, 2008a, 2008b; Helm & Remington, 2005; Remington, 2011; Van Heerden et al., 2015).

Type of attribute	Examples of and references to attributes
Decision-making ²	<ul style="list-style-type: none"> - Ability to act swiftly and decisively and take responsibility for tough decisions (Barshop, 2016; Bucero & Englund, 2007; Englund & Bucero, 2006; Pacelli, 2005). - Ability and willingness to serve as focal point for decisions beyond scope of authority of project manager (Bucero & Englund, 2007; Englund & Bucero, 2006).
Attributes that can be learned	<ul style="list-style-type: none"> - Understanding of business case development, seeks input and consensus on content of business case within organisation (Barshop, 2016; West, 2010). - Understanding of basic project management concepts, understands and can comment constructively at high level on scope, risk, schedule, and cost management¹ (Barshop, 2016; Remington, 2011). - Ability to understand and respond to results of independent reviews of project, and hold team accountable for such results (Barshop, 2016; Pacelli, 2005). - Ability to manage self, including time management (personal and priority) as a significant part of self-management (Crawford et al., 2008a, 2008b). - Possesses sufficient knowledge of business, its operations, market and industry, able to make informed decisions (Barshop, 2016; Bourne, 2015; West, 2010).
Positional (not in persona of individual)	<ul style="list-style-type: none"> - Appropriate seniority and positional power within organisation¹ (APM, 2009; Crawford et al., 2008a, 2008b; Helm and Remington, 2005; Van Heerden et al., 2015). - Continuity of sponsor on project throughout the lifecycle of the project (APM, 2009).

Table endnotes:

1. Attributes identified to include complex projects specifically (Remington, 2011).
2. Terminology identified for those attributes that are intrinsic to the persona of the individual and that are strongly people-focused.

2.3.4 Process to select sponsor, and criteria used

The project management literature analysed above revealed only one reference providing insight into how the required attributes of a sponsor were taken into consideration before selecting, assigning, nominating or identifying the sponsor. The APM (2009, p. 17) provided a clear approach to the question of how a sponsor should be chosen and appointed. It stated that the board of the organisation (refer Figure 2.1) should consider three critical success attributes in the selection of an appropriate individual as sponsor for a project. These attributes were organisational support, continuity, and alignment of interests. In addition, five personal attributes – understanding, competence, credibility, commitment and engagement – needed to be confirmed by the board in the selection process.

The following references helped to identify who was responsible for the outcome of having a sponsor on a project. In the OGC standard, *Managing successful programmes* (2007), the sponsoring group identified the senior responsible owner, who was then the *de facto* sponsor. Depending on the context of the project and the governance arrangements of the organisation, the selection of the sponsor was typically performed by the board (APM, 2009).

It was clear from the literature that the process of sponsor appointment on a project was not adequately addressed or described.

2.4 CONCEPTUAL FRAMEWORK FOR RESEARCH

The literature explored ultimately allowed the conceptual framework for the empirical research to be established. In essence the framework, as depicted in Figure 2.3, consists of a number of propositions identified from the literature that are converted into research questions. These, when answered, provide the necessary data to achieve the research aim. The identification of both the important and essential attributes of the executive sponsor, and their effective application, should lead to a higher probability of success for a megaproject.

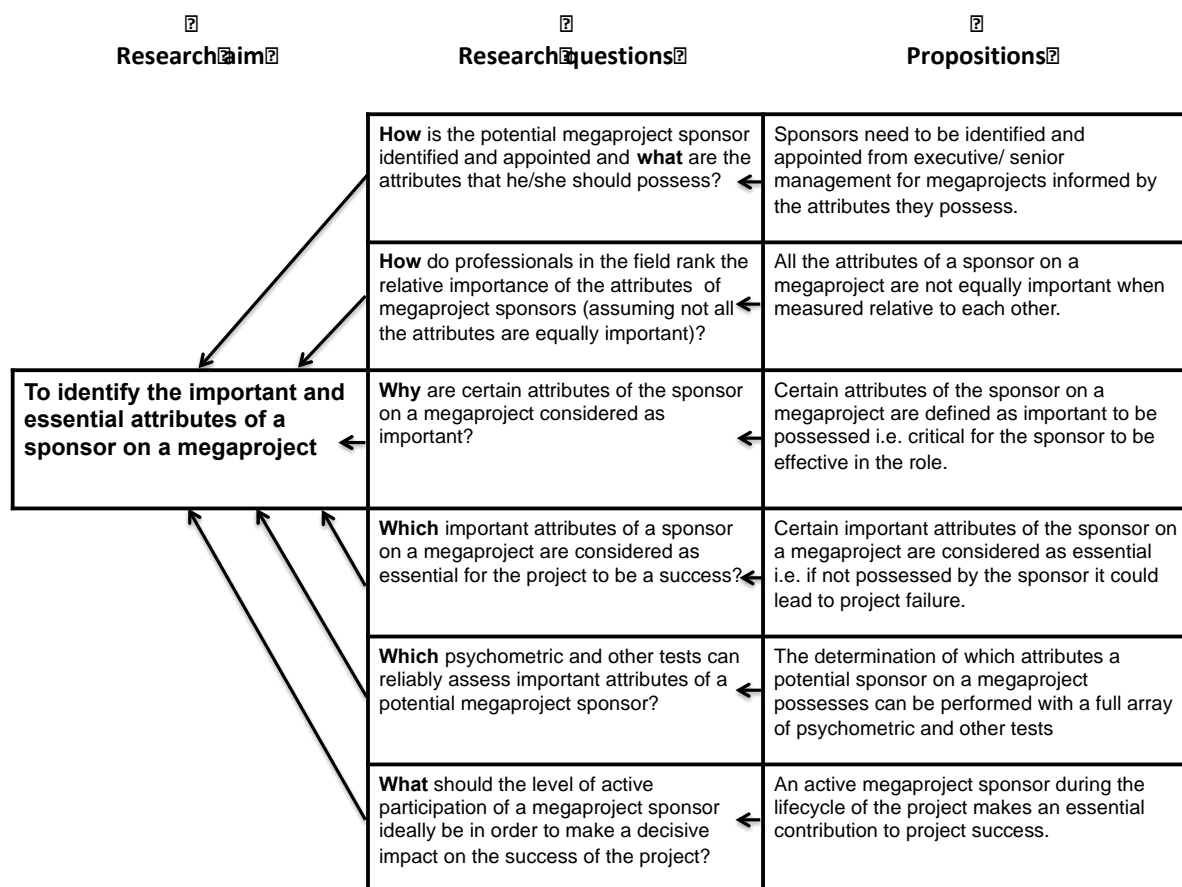


Figure 2.3: Research aim, research questions, and propositions

2.5 RESEARCH METHODOLOGY

An analysis of the five most frequently observed methodologies described by Creswell (2013) (i.e., narrative research, phenomenology, grounded theory, ethnography and case study) indicated that the case-study methodology best meets the requirements of the overall research study. This argument was based on the work of Merriam (1998), Stake (2000,

2005) and Yin (2014). The case for the study contained the elements of a 'contemporary phenomenon' (Yin) and 'thing/single entity', i.e., a person with attributes (Merriam, 1998), being the executive sponsor of a megaproject. The sponsor was in a 'real-life' context (Yin, 2014) within an integrated system (Stake, 2000, 2005) that had 'boundaries/ working parts' (Merriam, 1998; Yin, 2014), being the megaproject. The researcher had no control over the contemporary phenomenon (sponsor with attributes) or the context (megaproject), according to the defined requirements for a case (Yin, 2014). The investigation was of multiple cases, and the multiple-case study methodology made provision for this.

A number of megaprojects from multiple sites were identified for selection for study. Conceptually, the framework for the megaprojects selected for the research was contained within the following dimensions:

- Megaprojects located in South Africa;
- Successful and failed megaprojects with sponsors (as per the success or failure criteria described);
- Private or public sector megaprojects, with the public sector megaprojects being mainly in the domain of infrastructure creation by state-owned enterprises, accompanied by profit-motive considerations;
- Representation of the spectrum of industry sectors where megaprojects in South Africa are typically encountered, such as mining and minerals, energy (both electricity and petrochemical, chemical and fuels), telecommunications, and transport;
- Megaprojects with a value equal to or greater than ZAR10 billion/US\$1 billion at time of sanction of funds; and
- Megaprojects completed or commissioned since 2006, or under construction and with significant progress achieved to allow an assessment of success or failure.

The key relationships in the organisational context of a megaproject are:

1. Between the board or executive team and the sponsor; and
2. Between the sponsor and the project manager.

The board or executive team, the sponsor, and the project manager had been positioned as the dominant entities involved in the identification of both important and essential attributes that a sponsor on a megaproject needed to possess.

An analysis was done of the presence of megaprojects (industrial and infrastructure) with a profit motive in the South African context, using locally published databases. The analysis indicated that 10 projects qualified to be included in the study. These 10 projects met the ZAR10 billion/US\$1billion threshold as defined by Flyvbjerg (2014) and Merrow (2011) for megaprojects.

From the 10 projects, six were selected. This was within the range of four to 10 case studies required for multiple-case study methodology (Eisenhardt in Easton, 2010) and included both private and public sector projects. The industry sectors that are represented in the selection are mining and minerals (coal), energy (fuels and petrochemicals, i.e., wax from natural gas), transport (rail and pipeline), and energy (coal-fired and pumped-storage power generation). Using cost, schedule, and operability information available in the public domain, it was projected that the split between success and failure for South African megaprojects was reasonably similar to the global norm for failed megaprojects, i.e., 65% (Morrow, 2011).

The primary form of data collection for the overall study was semi-structured interviews, supplemented by a focus group activity. A need was determined to identify the potential impact (if any) on the research outcome of the presence of the units of analysis (the attributes) in a multiple-industry sector environment. A need was also identified to determine whether the attributes profile of a sponsor differed between megaprojects and smaller projects. The focus group activity was conducted with one specific organisation with a megaproject presence in the energy (fuels and chemicals) and mining industries.

A pilot case study was undertaken, and the results are discussed below. Semi-structured interviews (as per the proposed interview guide for the overall study) were conducted with individuals involved in the organisational context of the project. The pilot case study was performed on a megaproject that was targeted to improve the volumes of hard synthetic wax produced via an advanced proprietary (Fischer-Tropsch) technology from the operations facilities of a major petrochemical company ('the company') in South Africa. Two individuals essentially sponsored the project at separate stages. For the purpose of the pilot study, interviews were conducted with the member of the group executive committee (GEC) of the company that appointed the initial sponsor, the two executive sponsors, and the project director.

2.6 PILOT CASE STUDY

2.6.1 Background

The Fischer-Tropsch wax expansion project (FTWEP) selected for the pilot case study was a megaproject entailing the conversion of natural gas to wax and related products, achieved by replacing outdated reactors that had been built in the 1950s with new reactor equipment.

At the beginning of December 2009, the company approved an investment of R8,4 billion that was targeted at doubling the production of hard wax in South Africa. The investment was to be done in two phases. Phase 1 was planned to come into operation in 2012, and would increase the hard-wax capacity of the company by close to 40%. The investment for

Phase 1 included a pre-investment to optimise the remaining investment for Phase 2. Phase 2 was expected to come into operation by 2014.

Marketed through the Performance Chemicals Business Unit of the company, hard waxes, medium waxes, liquid paraffins, and waxy oils were used in a variety of industrial applications. Hard waxes were used in hotmelt adhesives, PVC processing, inks, paints and coatings, and asphalt applications.

Construction on Phase 1 began in 2010, and on Phase 2 in 2014. Table 2.5 reflects the breakdown of actual versus planned costs and schedules for the project.

Table 2.5: Actual versus planned costs and schedules for FTWEP

Description	Planned cost (ZAR/US\$ billion)	Actual costs (ZAR/US\$ billion)
Total cost	8,4/ 0,84	13,6/ 1,36
	Planned completion date	Actual completion date
Phase 1 schedule	2012	2014
Phase 2 schedule	2014	2016
Overall schedule	2014	2016

From a cost and schedule perspective, the FTWEP cannot be classified as a success. All the parties interviewed during the pilot study agreed with this statement. It was too early to predict a significant reduction in production during the initial two years since completion. Initial indications were that the production levels would be achieved as designed within the initial two years.

The APM (2009) advocated that continuity of sponsorship through the lifecycle of a project was one of three critical (read essential) success attributes that the owner should consider in order to improve the effectiveness of the sponsor. This was not achieved successfully on the FTWEP.

The first sponsor – who was also the originator of the concept to double the production of hard wax in South Africa – was nominated to be the sponsor of the project without a deliberate determination of what the attributes of the individual should be from a sponsor perspective. The member of the GEC responsible for the production and marketing of chemicals for the company to whom the sponsor reported made the decision. The individual nominated as sponsor was also the managing director of the wax business unit, a position he retained while being the sponsor for the project. As sponsor he demonstrated strong ownership of the business case for the project. At the time of investment approval, the sponsor identified an individual to manage (as general manager) the day-to-day running of the wax business unit, allowing the sponsor to focus more closely on the project. Prior to the completion of the engineering design, and well into construction of Phase 1 of the project, a

decision was made to transfer and relocate the sponsor. This created a distinctly uneasy situation for the project director, given the impact of such a lack of continuity in an already complex environment.

2.6.2 Results

The following comments recorded during the semi-structured interviews were found to be relevant to the potential effect the continuity of the sponsor on the project may have had on the project being classified as a failure:

Project director (regarding the departure of the initial sponsor and take-over by the subsequent sponsor):

‘...unproductive time for the project director when he needs to focus to get into the delivery of [the project]. You do not want to go back and try and help him to explain the business case all over again, which happens when you, for instance, ask for more capital.’

GEC member responsible for relocating the sponsor (on the comment by the project director):

‘The impression created by the project director at that time was: “Don’t worry, we’ve got this under control.” ... The risk assessment from my side was an understanding that the FTWEP had progressed to the extent where the problem-solving related far more to day-to-day project execution issues than to high-level big-issue challenges that we had faced initially.’

Prior to the completion of the construction of Phase 1, and before Phase 2 began, the sponsor role was allocated to the senior vice-president (SVP) responsible for Operations at the total site where the project was located (in Sasolburg, South Africa). Again, the individual concerned had to play a dual role: He had to take care of his normal responsibilities as SVP for Operations and be the sponsor of the project. It was noteworthy from the interviews that the GEC member responsible for the relocation of the sponsor eventually identified ‘continuity of the sponsor to be evident during the lifecycle of the project’ as an attribute essential for success.

The primary objectives in using a pilot case-study approach were to validate the appropriateness of the survey guide questions, fine-tune the plans for data collection, and determine the effective line of questioning (Yin, 2014). These objectives were achieved. The pilot case study also contained distinct facets of pre-testing. It not only focused on the development of lines of questioning for the research design, but also provided an opportunity to rehearse the data collection plan.

All the interviewees reflected that they considered the survey guide questions to be appropriate. However, some interviewees indicated that more questions could have probed who would make a good sponsor, and how adequately the selected sponsor had been prepared for the role.

It was recognised that the responses during the interviews with the four individuals involved (a GEC member, two sponsors, and the project director) would not allow for exhaustive deductions to be made. A comparison of the responses obtained during the interviews indicated (with overlap of at least three out of four responses) that the following attributes (in addition to the attribute of continuity) were not only considered important but also essential for megaproject success:

- Appropriate seniority, credibility, and power (both positional and personal) in the organisation;
- An understanding of, and ability to comment constructively on, basic project management concepts (e.g. scope, risk, schedule and cost management) at a high level;
- Ability and willingness to bring objectivity to the project team and to challenge project assumptions;
- Good negotiation skills, particularly in the context of providing or securing resources for the project manager, as well as conflict resolution and achieving compromises; and
- Tenacity to break down barriers.

2.7 CONCLUSION

This chapter is, in essence, the literature study laying the foundation for an exploration of those important and essential attributes required by the executive sponsor to achieve project success. Contextually, the exploration revolves around a relationship between the personal attributes of the individual carrying out the role of sponsor and how it directly influences his/her effectiveness. The exploration also revolves around the relationship between the effectiveness of the sponsor and its use as the single best predictor of project success or failure.

The interviews conducted in this pilot study laid the foundation for the other case studies that provided practical guidelines for company boards to select and appoint executive sponsors. The practical guidelines are directed at identifying individuals who would be better suited (because of their attributes) to contribute to the success of these economically important projects.

Guidance on how to identify and appoint an executive sponsor, and the type of testing required to determine what attributes the individual possesses, form part of the next paper.

The ranking of both the important and essential attributes of a megaproject sponsor will also be revealed.

2.8 ACKNOWLEDGEMENT OF PUBLICATION

This chapter was published in a slightly different format as Louw, W., Steyn, H., Gevers, W. & Wium, J. (2018). The executive sponsor as key factor in megaproject success – An exploratory study. In B. Nunes, A. Emrouznejad, D. Bennett & L. Pretorius (Eds.), *Towards sustainable technologies and innovation: Proceedings of the International Association for Management of Technology (IAMOT) 2018 Conference*, April. Birmingham, United Kingdom: Operations and Information Management Group, Aston Business School, Aston University.

Contributions of co-authors: The candidate performed the literature review, fieldwork (interviews, surveys) and analysis as required for the paper. He drafted the complete paper, which was then critically reviewed by the other authors, just as a PhD supervisor would do.

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CHAPTER 3

THE MEGAPROJECT SPONSOR AS LEADER³

3.1 INTRODUCTION

In the project management literature where the role of the sponsor was addressed, it was widely recognised that the role was a very important component of any project, and that the sponsor made a significant contribution to the success or failure of the project. Equally prevalent in the literature reviewed were references to leadership in the profile of the sponsor, for example, by Barshop (2016), Bourne (2015), Crawford, Cooke-Davies, Hobbs, Labuschagne, Remington and Chen (2008), the Project Management Institute (PMI) (2018), Remington (2011), Turner and Müller (2006), Van Heerden, Steyn and Van der Walt (2015) and West (2010). Leadership was also distinctly visible in the role of the sponsor as described in the international standards reviewed, namely the PMI's *Guide to the project management body of knowledge (PMBOK guide)*, 6th edition (2017), the International Project Management Association's (IPMA) *IPMA competence baseline (ICB)* (2015), the Association for Project Management's (APM) *APM body of knowledge*, 6th edition (2012), and the Office of Government Commerce (OGC) in the United Kingdom's standards (2007). All of these references confirmed the substantial component of leadership in the profile of the sponsor.

Because leadership is such a distinct component of the sponsor profile, it was considered appropriate to dedicate a separate chapter to it in the dissertation and not make it part of the literature review only.

Against this background, this chapter shows how leadership theories are used to identify instruments that can assist in the assessment of the leadership style and leadership traits or attributes of a sponsor. To end, a framework is proposed to identify assessment instruments to evaluate the leadership style and leader traits or attributes of a project sponsor.

For the purpose of the chapter, the term project includes the descriptors project-based programme and megaproject. Similarly, the term project manager includes the descriptors project director, programme manager, and programme director.

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Following Flyvbjerg (2014), a megaproject was defined as a large-scale, complex venture that typically cost US\$1 billion or more, took many years to develop and build, involved multiple public and private stakeholders, was transformational, and impacted millions of people.

The PMI (2014) stated that executive sponsors were primarily allocated to projects of strategic importance that were complex, carried a certain degree of risk, were highly visible, and were allocated a very sizeable budget. It could accordingly be deduced that a megaproject sponsor was from the executive (most senior) ranks of an organisation. For the remainder of this chapter, where the megaproject sponsor connotation is used, it implies by default that the sponsor is an executive sponsor.

The element of the complexity of projects deserves some attention in the context of the executive sponsor and his/her leadership. Stacey (1996) stated that complex projects required extraordinary leadership capabilities and management skills. Remington (2011) also argued that there was a positive correlation between project success and the capacity of the executive sponsor to recognise complexity as soon as possible.

The literature often distinguished between a complex project and a complicated project. The perspective of Chapman (2016), Maylor, Vidgen and Carver (2008) and Whitty and Maylor (2009) was that the distinction between the two was found in the nature of the relationships between the elements of the project system. Their view was that large-scale engineering and construction projects needed not necessarily be viewed as complex projects; that they were rather complicated projects. For this view to be valid, the interactions with and the influence of the environment needed to be predictable, and might sometimes be trivial.

Remington (2011) argued that leadership roles on large complex projects in the public sector were not as well defined as those on similar projects in the private sector. Her position was that selecting a single sponsor in a private-sector organisation with high leverage who can take responsibility for the success of the project was attainable. However, it was less attainable in the public sector, due to a multi-layered executive leadership structure.

This chapter does not elaborate on the theories of leadership and complexity of projects. Instead, it provides insight into the sponsor and leadership relationship by referring to leadership versus management in the role of the sponsor. An overview of the current literature on the relationship between the sponsor and project manager, and leadership effectiveness in the role of the sponsor, concludes section 3.2 of the chapter. In the sections that follow, leadership styles, emotional intelligence in the leadership context, and the identification of leadership attributes are presented.

3.2 SPONSOR OR SPONSORSHIP AND LEADERSHIP

Crawford et al. (2008) reviewed a number of national and organisational standards for project management to define the terminology 'sponsor' or 'sponsorship' in the project context. Six key themes identified by the authors emerged from the review:

1. The sponsor role was at a senior level in the owner (often also referred to as the client or customer) organisation;
2. The sponsor role contained substantial dimensions of leadership (as opposed to being just a management role);
3. The sponsor was responsible for ensuring that an effective governance framework is created for the project;
4. The sponsor was the owner of the business case for the project, and was ultimately responsible for the delivery or realisation of the benefits projected within the business case;
5. The sponsor was positioned structurally on the interface between the owner and project organisations, such that decision-making and support to the project manager were enabled, particularly for issues beyond the control of the project manager; and
6. An inconsistency existed between the standards in how the role of sponsor was carried out (either by an individual or a group).

The positioning of the sponsor was in a specific organisational context, i.e., between the business (permanent organisation) and the project (temporary organisation). It was primarily the upward relationship between the sponsor and the board or senior executive, and the downward relationship between the sponsor and the project manager(s) that formed the basis for the identification of leadership requirements in the role of the sponsor.

3.2.1 Key concepts in sponsor leadership or management

3.2.1.1 '*Confused state*' of the leadership field

Yukl (1989) stated that the 'confused state' of the leadership field could in part be attributed to the:

- Very large volume of publications;
- Great difference in approaches;
- Large number of confusing terms;
- Restricted focus of most researchers;
- High percentage of irrelevant or unimportant studies; and
- Absence of an integrating conceptual framework.

A quarter of a century later, it was apparent that leadership continued to be a field for much debate and disagreement, in which most researchers preferred multiple definitions of leadership and lists of attributes, as seen in De Klerk (2014) and Morris (2013). Available statistics, particularly on the topic of leaders and leadership in the literature from Amazon.com, indicated that it was a large and important subject (Bourne, 2015; De Klerk, 2014; West, 2010). It was accordingly concluded that the leadership field needed to be approached with caution.

3.2.1.2 Leadership versus management

As previously mentioned, the literature confirmed that the sponsor role was in essence a leadership role. However, the sponsor was also required to give direction and to clarify the framework for effective governance, of both the organisation and the project. This brought a management dimension to the role. De Klerk (2014) pointed out that decision-making (including strategic thinking and long-term planning), was similarly regarded as a managerial activity within leadership.

The examples provided led to the conclusion that there was a need and a place for both governance and decision-making in the role of the sponsor, and that it was unwise and incorrect to separate leadership and management in the role too forcefully. The reflections by Bourne (2015), De Klerk (2014), Morris (2013) and West (2010) on the matter of leadership versus management supported this conclusion.

3.2.2 Relationship between the sponsor and the project manager

In the organisational context, the sponsor was positioned at the interface between executive management or the board (the permanent organisation) and the project team (the temporary organisation). This implied that the sponsor was at a higher-order leadership or management level in the organisation than the project manager (Bourne, 2015; Remington, 2011; Van Heerden et al., 2015; West, 2010).

The relationship between the sponsor and the project manager was critical. A well-informed and insightful sponsor would realise that he/she was the senior partner in a relationship based on collaboration. Accordingly, the sponsor would not trespass on the typical responsibilities of the project manager in executing the project (Barshop, 2016; Bourne, 2015; Morris, 2013; West, 2010).

Turner and Müller (2006) stated that the best project performance was achieved where there was close collaboration between the client (i.e., the sponsor as representative of the client) and the project manager. Turner and Müller added that such close collaboration between the sponsor and the project manager, supported by appropriate communication, had been identified as a prerequisite condition for project success.

In related comments, Turner and Müller (2006) and Turner (2017) stated that there was a negative (potentially contentious) correlation between the visionary leadership competence of the project manager and project success. Their perspective was that the project manager was required to remain focused on the delivery of the project as approved. If the project manager was too visionary inclined, he/she would compromise the time and cost objectives of the project, i.e., there would be a negative impact on project success. Visionary competence and ensuring that the project remained linked to the strategy of the (owner) organisation needed to remain with the sponsor role.

The project team conceptually includes the sponsor, and requires a very clear role clarification between the sponsor and those who report to him/her, such as the project manager(s). Given the critical nature of the relationship, it is important that the sponsor appropriately uses the array of psychometric and other assessment instruments available prior to the appointment of the project manager. This statement is equally valid: That it is just as important that the board or senior executive use the assessment instruments appropriately prior to the appointment of the sponsor.

It was challenging to derive from the literature a description of the leadership role of the sponsor. This was because the literature typically focused either on leadership in the general management domain or on leadership in the project management and project manager domain. The role of the sponsor as leader in a collaborative relationship with the project manager was addressed only to a limited extent in the literature. Similarly, it seemed as if very little had been written about decision-maker(s) applying their mind(s) before the appointment of the sponsor to the project.

Bourne (2015) made a relevant comment on the governance process of nominating or appointing the sponsor. She stated: ‘...the era of the “accidental project manager” has largely passed, but we are still in the age of the “accidental sponsor.”’ Therefore, this chapter incorporates a wide but concisely described array of leadership styles, traits and attributes when addressing the role of the sponsor as leader. This aims to assist in the governance process of nominating and appointing the sponsor.

3.2.3 Leadership effectiveness of the sponsor

Leadership effectiveness could manifest itself in multiple ways. It ultimately depended on how well the leader chose on a daily basis between a diverse set of behaviours. De Klerk (2014) stated that these behaviours could oscillate from setting direction that inspired, through providing emotional support with compassion, to ensuring that the required governance was in place and was adequately monitored. Integral to effective leadership were the concepts of leadership styles, interpersonal skills (specifically emotional

intelligence), and traits and attributes. In the remainder of the chapter, the identification of leadership styles, leadership traits, and interpersonal skills are expanded upon in the relationship between attributes, effectiveness and project success (Figure 3.1). The references used to construct this relationship are Crawford et al. (2008), APM (2009), West (2010), Remington (2011), Morris (2013), PMI (2014) and Barshop (2016).

De Klerk (2014) stated that there was not one best way to be a leader, and that there was no single set of attributes that would guarantee project success, because the personalities of leaders and their followers and the contexts of projects varied.

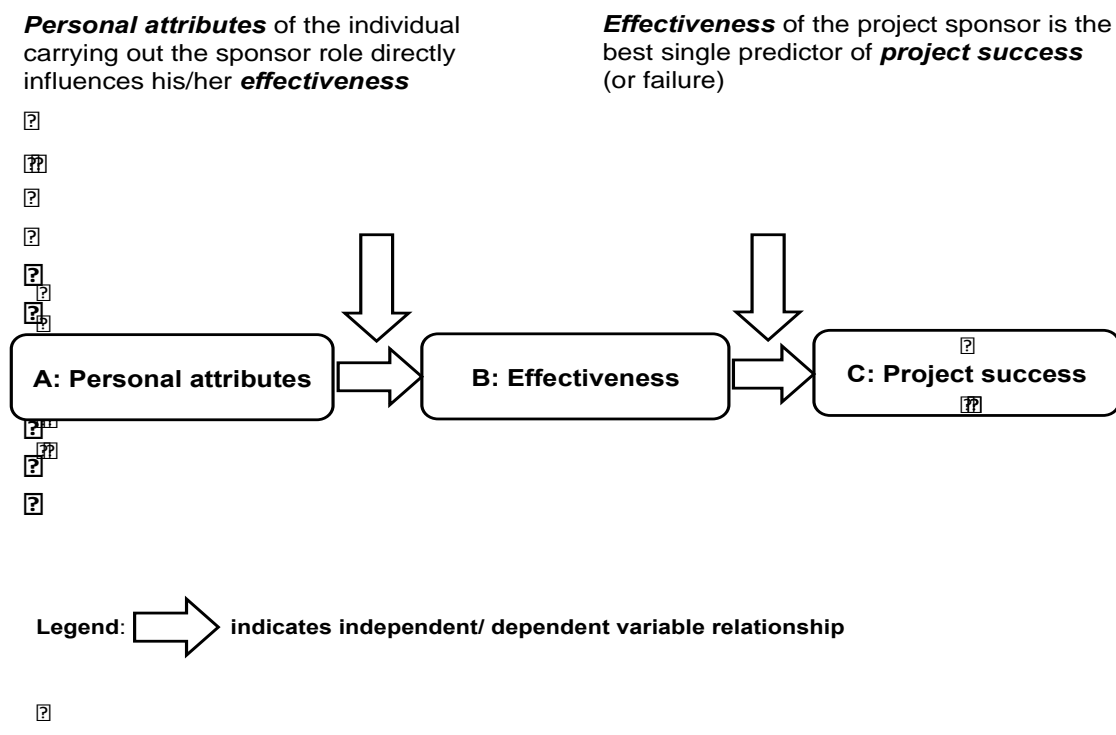


Figure 3.1: Relationship between personal attributes, sponsor effectiveness and project success

3.3 LEADERSHIP STYLES

3.3.1 Leadership styles selected for evaluation

For the purpose of this chapter, the leadership styles identified below were evaluated (with reasons provided). As criteria for inclusion in the selection, particular emphasis was placed on the availability of a style assessment instrument, on project management relevance, and on being part of latest developments. It is also to be noted that each style is mostly underpinned by a specific theory. The selected leadership styles are as follows:

- **Transformational leadership:** A distinct component of the Multi-factor Leadership Questionnaire (MLQ) assessment instrument;

- **Transactional leadership:** A distinct component of the MLQ assessment instrument;
- **Situational leadership:** Referenced in the project management context;
- **Authentic leadership:** More contemporary literature discussion, and measured with the Authentic Leadership Questionnaire;
- **Servant leadership:** More contemporary literature discussion, and possible to measure;
- **Charismatic leadership:** Accelerated development of theory in recent times, and a distinct component of the Leadership Behaviour Inventory (LBI) assessment instrument in the South African context;
- **Visionary leadership:** Accelerated development of theory in recent times, and a distinct interface with emotional intelligence;
- **Complexity leadership:** Potentially answering the questions of complex versus complicated, and the possibility for use in the context of a megaproject; and
- **Shared leadership:** Addressing the phenomenon that organisations are migrating or have migrated to a knowledge-driven era in which multiple cultures and multiple geographies are distinctly prevalent.

An indication of the leadership theory and style coverage in the chapter is contextualised through Hernandez, Eberly, Avolio and Johnson (2011), who developed a two-dimensional framework that reflected:

1. Where leadership comes from (the locus); and
2. How leadership is transmitted or enacted (the mechanism).

The framework in Figure 3.2 depicts the placing of an array of leadership theories that have been developed since the early 1900s within this two-dimensional framework. The theories underpinning the leadership styles selected for evaluation are presented in bold red in Figure 3.2.

Some of the leadership styles (and their respective theories) selected for evaluation are not reflected in the original framework of Hernandez et al. (2011), i.e., servant, visionary and shared leadership. Servant and visionary leadership theories are placed in the framework to demonstrate their relation to the transformational, charismatic and authentic leadership theories. Hernandez et al. (2011) also posited that shared leadership theory was accommodated in the framework by considering the full spectrum of loci and mechanisms.

The leadership styles (underpinned by their respective theories) selected for evaluation indicated a distinct presence in the 'behaviours (to do)' mechanism, spread out over the whole spectrum of leadership loci. This was not unexpected, and it fits well with the central role that behaviours play in the leadership role of the sponsor. Sparrowe and Liden (2005)

inferred specifically that behaviours were the primary mechanism for leadership. It was thus concluded that leadership was a distinct behaviour mechanism within sponsorship.

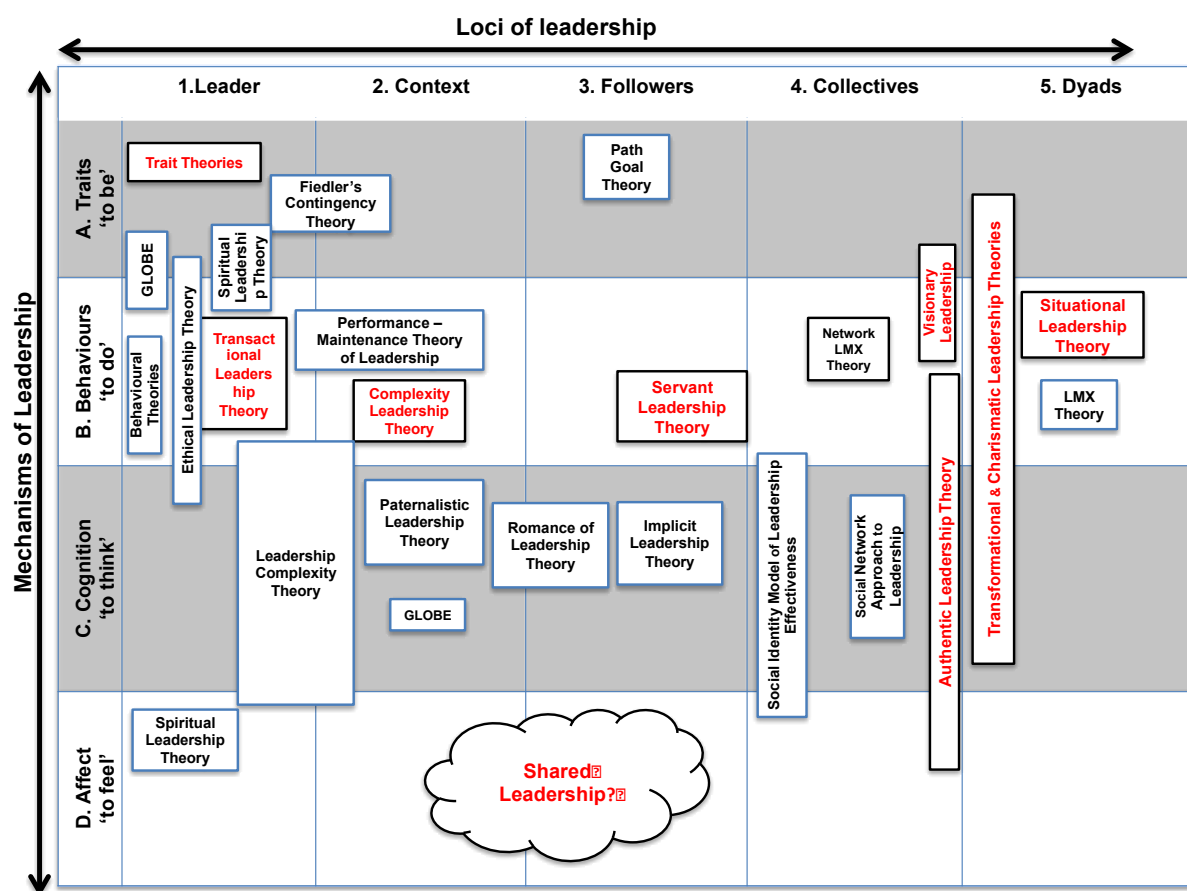


Figure 3.2: Placing leadership theories within a two-dimensional framework

Source: Adapted from Hernandez et al. (2011)

3.3.2 Evaluation of selected leadership styles

West (2010) commented that the first key skill the sponsor required for the leadership component of the role was vision. This comment was not only directed at identifying whether the sponsor had the ability to be visionary, it also focused on the issue that the development of vision for the project needed to be both compelling and powerful to align those involved with the project.

The transformational, charismatic and visionary leadership styles were part of what was termed 'new-genre' leadership theories. They definitively incorporated and emphasised concepts such as symbolic leader behaviour, being visionary, communicating inspirational messages, surfacing emotional feelings, propagating ideological and moral values, and being intellectually stimulating. Visionary leadership was pertinently influenced by the act of

vision creation. However, it was not a leadership style that was accompanied by an operationalised and validated assessment instrument.

Transformational and charismatic leadership styles continued to be mentioned in the literature in the same context, despite the concerns raised by Antonakis, Fenley and Liechti (2011) and Yukl (2011). Yukl stated that charismatic and transformational leadership styles were regularly considered to be the same. Yet there were credible differences that could not be ignored, and crucial conceptual deficiencies that needed to be addressed. Antonakis et al. (2011) supported the argument of Yukl (2011) by stating that charismatic and transformational leadership styles were related, but that they were theoretically recognisably different. Judge, Woolf, Hurst and Livingston (2006) maintained that, in the majority of cases (in the context of transformational and charismatic leadership styles), an individual with a high score on one leadership style would also have a high score on the other leadership style.

From the literature analysis on leadership, it was possible to contextualise the role of the executive sponsor in an 'identification of leadership' construct as follows:

- Leadership within the sponsor profile was a given;
- Assistance to the decision-maker(s) responsible for the appointment or selection of the sponsor was available. The leadership style of the incumbent could be determined via an operationalized and validated assessment instrument;
- There was no leadership style that on its own contained all the elements required for effective leadership;
- Outstanding leadership relied significantly on the action of putting into words and feelings a viable and inspiring vision; and
- Identifying whether the sponsor had the ability to be visionary could be performed via the MLQ and LBI assessment instruments. Very importantly, this could ensure that the project remained linked to the strategy of the owner organisation.

By using the construct above as a filter for screening the nine leadership styles selected, four styles remained for further consideration. Bass and Avolio (1993) argued that this number arose because transformational and transactional leadership styles were merged into one style derived from the full-range transformational leadership theory. This merging created the broader context of the transformational leadership style. Additionally, those theories that were not supported by an operationalized and validated assessment instrument were eliminated from the list. The four theories remaining were transformational, charismatic, servant and authentic leadership styles.

Authentic and servant leadership styles were different from transformational (and charismatic) leadership styles. Diddams and Chang (2012) concluded that creating an inspirational vision to motivate followers was not necessarily the forte of an authentic or servant leader. The intent of reducing the number of theories was not to reduce them to an absolute minimum. Rather, it was to identify leadership styles that enabled the decision-maker(s) to assess practically the leadership style of the designated sponsor on a megaproject prior to appointment.

The conclusion is that transformational and charismatic leadership styles are the preferred styles to be tested for when identifying an executive sponsor for a megaproject. Operationalized and validated assessment instruments support both leadership styles. For transformational leadership it is the MLQ, based on the work of Bass and Avolio (1997), and referred to as the MLQ Form 5X. For charismatic leadership, it is the LBI, based on the work of Spangenberg and Theron (2002).

At this juncture it is important to note that there is a relationship between the emotional competencies of the leader (including emotional expressivity) and a range of leadership theories. Groves (2006) stated that evidence for the existence of the relationship was provided by theoretical and empirical studies on transformational, charismatic and visionary leadership styles.

3.3.3 Conclusion on leadership styles

No leadership style on its own contained all the elements required for effective leadership. Yukl (1999) stated that it was also not reasonable to expect that all aspects of leadership behaviour should be included in one theory. Dulewicz and Higgs (2004) suggested that a consensus was developing in the leadership literature that there was not one leadership style for effective (leadership) performance. De Klerk (2014) stated that, although there were multiple instances of demonstrated good leadership, there was not one particular optimal leadership style that could be advanced for project management. It was concluded that the same argument could be offered for executive sponsorship.

Since the beginning of this millennium, a growth in emerging leadership theories (e.g. neurological perspectives on leadership) has occurred. There has also been a continued increase in theories relating to leading for creativity and innovation, toxic or dark leadership, and strategic leadership (Dinh, Lord, Garnder, Meuser, Liden & Hu, 2014). However, a number of established leadership theories (and their styles) continued to be of interest in the leadership field. These theories and styles included neo-charismatic (which provided for transformational and charismatic leadership), information processing, trait, and leader-follower exchange leadership. Other leadership theories, such as behavioural approaches,

contingency theory, and path-goal theory have not attracted similar interest (Dinh et al., 2014).

3.4 EMOTIONAL INTELLIGENCE WITHIN LEADERSHIP

As indicated in the 'identification of leadership' construct above, a number of leadership styles acknowledged that outstanding leadership relied significantly on the action of putting into words a viable and inspiring vision. Part of this included the concept of emotional expressivity. Groves (2006) posited that emotional expressivity was a communication style that contained distinct elements of variation in voice, facial expressions, eye contact, and coherent gestures of the hands. Groves added that emotional expressivity, plus other emotional competencies such as self-awareness, self-monitoring and empathy, were important dimensions in the broader context of emotional intelligence (EI). Stein, Papadogiannis, Yip and Sitarenios (2008) supported the importance of EI by stating that it was an indispensable component of leadership. Similarly, Dulewicz and Higgs (2004) reflected that statements about the importance of EI for effective leadership were more than elegant phrases, and that such statements were in fact firmly established by verifiable (empirical) evidence.

Bar-On (2006) stated that three conceptual models dominated the field of EI, namely the:

- Salovey-Mayer model (Mayer & Salovey, 1997);
- Goleman model (Goleman, 1998a, 1998b); and
- Bar-On model (Bar-On, 1997, 2000).

Riggio and Reichard (2008) stated that the more substantive of the three models was the 'emotional abilities' model developed by Salovey, Mayer and colleagues. In the broader context of EI, Riggio and Reichard (2008) stated that research evidence provided substance for the conclusion that people skills (the grouping of emotional and social skills) were critical for leadership effectiveness. It should also be noted that training programmes were able to improve emotional and social skills, i.e., EI could be learned and developed (Ashkanasy & Dasborough, 2003; Riggio & Reichard, 2008).

Although not the more substantive of the three models above (Riggio & Reichard, 2008), Bailie (2005) reflected that one of the first researched psychometric assessment instruments to be widely applied for EI was the Emotional Quotient Inventory (EQ-i), based on the Bar-On model. A brief description of the model follows below.

The model was based on the wider construct of EI and social intelligence. Bar-On (2006) argued that the wider construct most likely represented interrelated components of the same construct, and was more correctly referred to as 'emotional-social intelligence' (ESI).

The EQ-i referred to above measured ESI (Bar-On, 2006). The responses of the individual resulted in a total emotional quotient (EQ) score plus five summarised sub-scores that measured intrapersonal, interpersonal, stress management, adaptability, and general mood competencies.

In the project management/management of projects domain, Morris (2013) referred (somewhat cynically) to EI as ‘a salad of many other behavioural skills’. Morris maintained that most of the behaviours were not easy to describe exactly, and were not established in terms of how and when they should be used or measured. His contention was that, for all intents and purposes, EI skills were elevated beyond their accepted levels of comprehension. The question could be asked whether there would be a different perspective if the comments were made within a sponsor rather than a project manager context. The focus on leadership was at a more elevated level in the sponsor role than in the project manager role. The sponsor role was at a strategic and tactical level, while the project manager role was at a tactical and operational level (Bourne, 2015; Remington, 2011; West, 2010).

The debate continued in the literature about whether EI is an ability construct, a self-perception construct or a behaviour construct. In the meantime, research had found that there was a significant predictive and evidence-based relationship between EI and transformational leadership (Boyatzis, Batista-Foguet, Fernandez-i-Marin & Truninger, 2015; Dulewicz & Higgs, 2004; Mandell & Pherwani, 2003).

For the purpose of their study to determine the EI of leaders at executive management level, Stein et al. (2008) used the skills- and trait-based EQ-i assessment instrument. Particular value was gained from the EQ-i method in the assessment and development of individuals who were either in an executive role or about to be promoted to an executive role. This capability of the EQ-i method regarding the role of the individual being assessed was congruent with the description of the organisational level that the designated sponsor of a megaproject would occupy. The results indicated, among other things, that it was very important for individuals to know specifically what traits and attributes were required on different occasions to perform the executive role successfully.

The leadership traits and attributes required of the executive sponsor to deal effectively with the demands of the role are described in the next section. An explanation is provided of the difference between leadership traits and attributes. Attributes identified from the literature, and models used for trait identification are also described.

3.5 LEADERSHIP TRAITS AND ATTRIBUTES

Significant ambiguity and confusion originated from the use of the term ‘trait’ in the literature (Zaccaro, Kemp & Bader, 2004). It was often used to refer to temperament, personality, disposition and abilities, as well as any inherent qualities that the individual may have, such as physical or demographic attributes. Zaccaro (2007) defined leadership traits as:

‘Relatively coherent and integrated patterns of personal characteristics, reflecting a range of individual differences that foster consistent leadership effectiveness across a variety of group or organisational situations.’

Zaccaro (2007) noted that traits were traditionally referred to as ‘personality attributes’. The majority of modern leader trait perspectives, with specific reference to the qualities that differentiated leaders from non-leaders, included not only personality attributes but also motives, values, cognitive abilities, social and problem-solving skills, and expertise. The Zaccaro (2007) perspective was very similar to that of Yukl (2006), who defined traits in the context of leadership effectiveness. In his definition, Yukl included personality, motives, needs and values. Zaccaro (2007) also stated that the latest developments in research on the traits and attributes of a leader included an individual’s ability to change his/her behaviour as the situation changes. He grouped the attributes in a number of integrated sets:

- Cognitive capacities that included general intelligence, cognitive complexity and creativity;
- Personality or dispositional qualities that included adaptability, extroversion, risk propensity, and openness;
- Motives and values that included the need for socialised power, the need for achievement, and the motivation to lead;
- Social capacities that included social and emotional intelligence, and persuasion and negotiation skills;
- Problem-solving skills that included metacognition, problem construction, solution generation, and self-regulation skills; and
- Tacit knowledge.

Given how concepts were used interchangeably between traits and attributes (e.g. personality as a trait and as an attribute), it was not surprising to encounter in the literature an array of descriptors that attempted to describe the attributes of the sponsor. Other than attributes, the list included behaviours, characteristics, skills, attitudes, factors, capabilities, abilities, and criteria.

3.5.1 Attributes identified from the literature

A comprehensive list of leader attributes was compiled from the literature. A thematic grouping of the identified attributes follows.

3.5.1.1 Strategic

- An understanding of the strategy of the organisation, the need to obtain regular updates on the strategy, and an appreciation of how the project contributes to the corporate strategy (West, 2010);
- Political knowledge of the organisation and being politically savvy (Crawford et al., 2008; Helm & Remington, 2005; Van Heerden et al., 2015);
- An understanding of the role and its significance, and the need to align the project with the interests of the organisation (APM, 2009); and
- Ability to provide clarity of direction (including the development of a compelling vision) within the context of the strategy and governance arrangements of the organisation (APM, 2009; Bucero & Englund, 2007; Englund & Bucero, 2006).

3.5.1.2 Leadership and management

- Ability to lead for results and success by conveying a sense of urgency and focusing on what matters most (Bucero & Englund, 2007; Englund & Bucero, 2006);
- Ability to motivate the team to deliver the vision (Crawford et al., 2008; Helm & Remington, 2005);
- Ability to provide leadership consistent with the culture and values of the organisation (APM, 2009);
- Possesses the combination of knowledge, personal attitude, and skills to fulfil the role (APM, 2009);
- Ability to take a holistic view (see the big picture) and engage peers in the organisation for advice and support for key decisions (Barshop, 2016; Remington, 2011; West, 2010);
- Ability to delegate authority to appropriate levels and to provide ad-hoc support to the project team rather than to micromanage (Crawford et al., 2008; Helm & Remington, 2005; Remington, 2011);
- Ability to demonstrate credibility, i.e., acceptance by the organisation and stakeholders as suitable for the role (APM, 2009; Crawford et al., 2008; Helm & Remington, 2005; Van Heerden et al., 2015). Merriam-Webster (n.d.) defined 'credibility' as 'the quality or power of inspiring belief';

- Possesses personal power, i.e., the ability to influence others where the source of influence resides in the person instead of being vested by the position he/she holds (BusinessDictionary, n.d.)
- A willingness to partner with the project manager and team to deliver project objectives (Remington, 2011); and
- Possesses good negotiation skills and courage, particularly in the context of providing, securing or battling for the availability of resources (financial, people or other) for the project manager (APM, 2009; Barshop, 2016; Bourne, 2015; West, 2010).

3.5.1.3 *Dealing with ambiguity and complexity*

- Possesses interpersonal and critical thinking skills, including the ability to work with and handle ambiguity, particularly when dealing with complex projects (Barshop, 2016; Crawford et al., 2008; Helm & Remington, 2005; Van Heerden et al., 2015); and
- An understanding and willingness to explore how complexity can manifest in projects (Remington, 2011).

3.5.1.4 *Motivation*

- Ability to engage by being willing to take personal ownership and to act in the long-term interest of the organisation (demonstrating loyalty, motivation, courage and commitment) (APM, 2009); and
- Ability to provide motivational support for the project team when the going gets tough (Remington, 2011).

3.5.1.5 *Communication*

- Ability to demonstrate high-level and diverse communication skills, including the ability to listen and to communicate relevant organisation-wide issues to the project team (Crawford et al., 2008; Helm & Remington, 2005; Van Heerden et al., 2015); and
- Ability to foster an atmosphere of trust and open communication with the project manager and the project team (Barshop, 2016; Bucero & Englund, 2007; Englund & Bucero, 2006).

3.5.1.6 *Open to learning*

- Ability to foster an atmosphere of trust and open communication with the project manager and the project team (Bucero & Englund, 2007; Englund & Bucero, 2006);
- Ability to exhibit a high capability for self-reflection and willingness to engage other experts in problem-solving (Remington, 2011); and
- Ability to promote knowledge creation and reuse, and being open to learning (Barshop, 2016; Bucero & Englund, 2007; Englund & Bucero, 2006).

3.5.1.7 *Networking*

- Ability to develop and foster (high-level) effective connections between and within the organisation and the project team (Bourne, 2015; Helm & Remington, 2005; Remington, 2011; Van Heerden et al., 2015);
- Ability to demonstrate personal compatibility with other key players in the organisation (Crawford et al., 2008; Helm & Remington, 2005; Van Heerden et al., 2015);
- Ability and willingness to provide objectivity to the project team, and challenge the project assumptions (including a push to explore meaningful alternatives to maximise value) (Barshop, 2016; Helm & Remington, 2005; Van Heerden et al., 2015); and
- Possesses the tenacity to break down barriers (West, 2010).

3.5.1.8 *Decision-making*

- Ability and willingness to serve as a focal point for decisions beyond the scope of authority of the project manager (Bucero & Englund, 2007; Englund & Bucero, 2006); and
- Ability to act swiftly and decisively, and take responsibility for tough decisions (Barshop, 2016; Bucero & Englund, 2007; Englund & Bucero, 2006; Pacelli, 2005).

3.5.1.9 *Attributes that can be obtained from experiential learning*

- An understanding of business case development, and seeking input and consensus on the contents of the business case amongst executives in the organisation (Barshop, 2016; West, 2010);
- An understanding of basic project management concepts, and understanding and commenting constructively at a high level on scope, risk, schedule and cost management (Barshop, 2016; Remington, 2011);
- Ability to understand and to respond to the results of independent reviews of the project, and to hold the team accountable for such results (Barshop, 2016; Pacelli, 2005);
- Ability to manage self, i.e., to manage him/herself effectively within the time commitment agreed (both short- and long-term), with time management (personal and priority) being a significant part of self-management (Crawford et al., 2008); and
- Possesses sufficient knowledge of the business and its operations, market and industry to be able to make informed decisions (Barshop, 2016; Bourne, 2015; West, 2010).

3.5.1.10 *Positional attributes (not necessarily in persona of individual)*

- Appropriate seniority and positional power within the organisation (APM, 2009; Crawford et al., 2008; Helm & Remington, 2005; Van Heerden et al., 2015); and

- Continuity of the sponsor on the project to be evident throughout the lifecycle of the project (APM, 2009).

An appraisal of the attributes listed above might suggest that one individual was unable to fulfil the whole spectrum of attributes. James, Rosenhead and Taylor (2013) and Remington (2011) shared this perspective, saying that it was possible to make provision for all the attributes, but that they rarely existed in one person. In a similar way, De Klerk (2014) posited that the list of recommended leadership characteristics and traits prescribed in the literature was unrealistically comprehensive and optimistic. To achieve just some of the characteristics required an individual with extraordinary capabilities.

As part of the larger study, this dissertation explores the executive sponsor as a key factor in megaproject success. The above listing of identified attributes is used as a basis for the identification of important and essential attributes that are required for a megaproject's success.

Within the context of leadership trait theories and their focus on the identification of personality traits, the instruments in the next sub-section have been identified in the project management literature. These instruments are part of a broader selection of psychometric assessment instruments, and indicate clear potential to assist the board or executive management in identifying a sponsor for a megaproject.

3.5.2 Models for leadership trait identification

Research during the 1970s revealed that the difference between the success and failure of a team was dependent not on factors such as intellect, but more on behaviour (Belbin, 2010a; 2010b). Nine clusters of behaviour that individuals adopted when participating in a team (Belbin Team Roles) were identified.

A battery of psychometric assessment instruments underpinned the model. These tests comprised measures for:

- High-level reasoning ability (the Critical Thinking Appraisal);
- Personality (the sixteen scales of the Cattell Personality Inventory or 16PF); and
- An outlook that was achieved via a Personal Preference Questionnaire (PPQ) developed specifically for the purpose (Belbin, 2010a; 2010b).

Remington (2011) stated that the Belbin Team Role profile was particularly useful in assisting project leaders (including sponsors leading complex projects) to understand the how of compiling teams and work groups.

Bourne (2015) used the five traits in the Neuroticism-Extraversion-Openness Personality Inventory Revised (NEO-PI-R) model (McCrae & Costa, 1997) for her discussion on leader

trait theory in project management. Bourne argued that a leader could improve (with conscious effort) on these traits, in a similar way to how EI can be improved. Bourne also commented that the Myers-Briggs Type Indicator (MBTI) instrument was the best known of the personality assessment tools that categorised personality.

The MBTI, developed by Katherine Briggs and Isobel Briggs Myers (Percival, Smitheram & Kelly, 1992), essentially provided an indication of the psychological preferences of the individual in making decisions and how he/she perceived the world, resulting in 16 distinctive personality types. The four pairs of alternative preferences (based on the theory of Carl Jung originally published in 1923) used in the MBTI instrument were Introversion (I) and Extraversion (E), Sensing (S) and Intuition (N), Thinking and Feeling (F), and Judging (J) and Perception (P). Morris (2013) reflected that many project personnel, at some time in their careers, took the MBTI test or something similar.

The next section brings into perspective the array of (psychometric and other) assessment instruments that are available and being used in practice to identify the leader traits and attributes described above. The instruments were identified after engagement with JvR Psychometrics and BLOSS Southern Africa, two South African companies specialising *inter alia* in psychometric assessments. The context of the engagement with these organisations was an exploration of leadership styles and traits and EI assessment instruments and of the potential to use these instruments to identify the leader traits or attributes of the sponsor.

3.6 PRACTICAL APPLICATIONS (INSTRUMENTS) FOR THE MEASUREMENT OF LEADERSHIP TRAITS OR ATTRIBUTES

A representation of the different types of psychometric and other assessment instruments identified and typically used in South Africa is presented in Table 3.1.

It is clear from Table 3.1 that there are an adequate number of practical measurement instruments or tools in the psychometric assessment domain to determine the leadership traits and attributes of a leader. As an example, the Cognitive Process Profile (CPP) and Critical Reasoning Test Battery (CRTB) instruments, without significant customisation, can be used to deal with the attributes that focus on critical thinking skills, ability to handle ambiguity, and dealing with complexity.

In a related perspective, the PMI (2014) argued that it was beneficial for an executive sponsor to perform a self-evaluation of his/her skills (to be read in the broader context of leadership styles, traits and attributes). By inference, it was concluded that this self-evaluation should be performed very early in the 'allocation of the sponsor to the project' action. This deduction was based on the statement in the PMI (2014) that the self-evaluation

was even more valuable if the sponsor had a very good appreciation of sponsor requirements. This created an opportunity for the sponsor to focus on those skills in which he/she was strong. For skills that the sponsor lacked, the assistance of specialists (in change management) could be obtained in order to address the balance of strengths and weaknesses (PMI, 2014).

Table 3.1: Psychometric and other assessment instruments typically used in South Africa to identify leader traits and attributes at a summarised level

Name of instrument	Purpose or identification of
Cognitive Process Profile (CPP) Developed for and distributed by Cognadev UK/SA (Prinsloo & Barrett, 2013)	Capability (including identifying the way in which an individual thinks when dealing with new information and solving problems of varying complexity. Assesses aspects of individual's potential for future cognitive development and growth.)
Bar-On Emotional Quotient Inventory (EQ-i) Developed by Bar-On (Yukl, 1999) and made available by JvR Psychometrics SA	EI (including self-perception, self-expression, interpersonal relationships, decision-making, stress management and wellbeing)
Critical reasoning tests, i.e., the Critical Reasoning Test Battery (CRTB). 15 Factor Questionnaire (15FQ), first published by Psytech in 1992. Developed as an alternative to the 16PFR identified by Cattell (1946). Developed by Psytech International and delivered by Psytech SA, among others.	Reasoning ability (including measuring critical verbal and critical numerical reasoning skills. Designed for testing of executive managers.)
Occupational Personality Questionnaire (OPQ) Developed by Saville, Sik, Nyfield, Hackston & McIver (1996) and distributed by JvR Psychometrics SA and Psytech.	Personality (including influence, sociability, analysis, creativity, change, structure, emotions and dynamism)
Giotto Developed by Rust (1999) for the Psychological Corporation in the UK, and distributed in South Africa by GiottoSA.	Workplace integrity behaviour (instrument developed to unravel complex nature of personal integrity as it relates to the workplace)
Hogan Personality Inventory (HPI) Developed by Hogan Assessment Systems, Inc. and made available by JvR Psychometrics SA.	Personality (including adjustment, ambition, sociability, interpersonal sensitivity, prudence, inquisitiveness and learning approach)
Belbin Team Roles Developed by Belbin (2010a, 2010b)	Measures high-level reasoning ability (the Critical Thinking Appraisal), personality (the 16 scales of the Cattell Personality Inventory or 16PF) and outlook, via a Personal Preference Questionnaire (PPQ). Nine clusters for team roles, i.e., company worker, chairman, shaper, plant, resource investigator, monitor-evaluator, team worker and completer-finisher.
Neuroticism-Extraversion-Openness Personality Inventory Revised (NEO-PI-R) model Developed by McCrae & Costa (1997)	Focus on personality (includes five traits, i.e., extraversion, conscientiousness, openness, (low) neuroticism and agreeableness)

Name of instrument	Purpose or identification of
Myers-Briggs Type Indicator (MBTI) Developed by Briggs and Myers (Percival et al., 1992)	Provides indication of and measures the psychological preferences of the individual when making decisions and how he/she perceives the world. From interactions between the preferences in the MTBI result 16 distinctive personality types. Four pairs of Jungian theory-based alternative preferences (Introversion-Extraversion, Sensing-Intuition, Thinking-Feeling and Judging-Perception)

3.7 CONCLUSION

The chapter confirms that the sponsor on a megaproject is primarily a leader who requires an ability to ensure continually that the project remains synchronised with the strategy of the owner organisation.

This chapter uses leadership theories to identify instruments that can assist in the assessment of the leadership style and leader traits and attributes of a sponsor. It was found that the styles of transformational and charismatic leadership are the most appropriate for the megaproject sponsor. As indicated in Section 3.4.1, outstanding leadership relies significantly on the action of putting into words a viable and inspiring vision. Both styles contain the ability to develop a vision for the project that is both sufficiently compelling and powerful to align those involved with the project. The assessment instruments referred to as the MLQ Form 5X and the LBI need to be used to determine the leadership style of a designated sponsor.

In addition to the two leadership-style assessment instruments, a number of assessment instruments are identified in Table 3.1 that can assist in identifying the leader traits and attributes of the sponsor. Collectively, a framework is thus proposed to identify assessment instruments for the leadership style and leader traits and attributes of a project sponsor.

Although the list of recommended leadership attributes identified from the literature is comprehensive, it is optimistic. It is unrealistic, however, that one individual should possess all of these attributes. Additional effort is thus needed to identify the essential attributes of a sponsor that will allow him/her to perform the role effectively.

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CHAPTER 4

RESEARCH METHODOLOGY AND DESIGN

4.1 INTRODUCTION

The research methodology and design are introduced in this chapter.

According to Schwandt (2007, p. 195), research methodology was defined as:

‘A theory of how an inquiry should proceed. It involves analysis of the assumptions, principles and procedures in a particular approach to inquiry.’

Methodologies further clarified and defined the following (Creswell & Tashakkori, 2007; Schwandt, 2007; Teddlie & Tashakkori, 2006):

- The kinds of problems that were worth investigating;
- What constituted a researchable problem;
- Testable hypotheses;
- How to frame a problem in such a way that it could be investigated using particular designs and procedures; and
- How to select and develop appropriate means of collecting data.

Research design in turn was defined as ‘a plan for a study and in particular provides the overall framework for collecting data’ (Leedy, 1997, p. 195). It was further defined as a plan for the selection of a subject, research sites, and data collection procedures to answer the research question(s). The goal of a sound research design was stated as providing results that were judged credible (MacMillan & Schumacher, 2001, p. 166). Research design was also viewed as a strategic framework for action that served as a bridge between research questions and the execution or implementation of the research strategy (Durrheim, 2004). Ghauri and Grønhaug (2005, p. 56) stated: ‘The research design is the overall plan for relating the conceptual research problem to relevant and practicable empirical research.’

If the methodology is the ‘how to’ of the research as per the above references it then, in the same context, follows that the research design is the plan for arriving at the framework that the research will be performed in.

4.2 PRACTICAL RESEARCH OBJECTIVES AND MAKING A CONTRIBUTION

From a conceptual perspective, the chapter additionally provides an indication of the contribution of the research, and how the contribution was developed. The initial intent of the

dissertation was not to extend, refine or generate a theory from what is currently in the literature. It rather intended to explore how the study could contribute through case studies to an improvement of knowledge of the following broader and more holistic themes derived from literature. Through the exploration, a relationship was identified with the themes:

- Personal attributes of an individual carrying out the role of sponsor on a project influence the effectiveness of the sponsor directly; and
- Effectiveness of the sponsor is the single best predictor of project success.

The logic and independent-dependent variables in the relationship and themes described are graphically portrayed in Figure 2.1 in Chapter 2. The variables included in the relationship are attributes (of the sponsor), effectiveness (of the sponsor) and project success or failure. In this relationship, effectiveness is a dependent variable of attributes. So too is project success a dependent variable of effectiveness. Attributes (as a collective) are considered an independent variable.

A practical objective of the research is the identification of, within the broad array of attributes described by literature, those attributes that are important for the sponsor on a megaproject to possess. These important attributes are further refined in the research to those that are essential for megaproject success. The final objective is that the attributes identified contribute to the improvement of the current (very poor) global success rate of megaprojects.

A contribution was typically considered at three separate levels, i.e., whether it contributed to theory (extension, refinement or generation), method (application of a new methodology in an existing field and context) or context (e.g. how the findings translated beyond the secular and contextual limitations of the here and now) (Ridder, Hoon & McCandless, 2015; Volschenk, 2016; Whetten, 1989).

As indicated earlier, the research did not initially intend to contribute at a theory level. However, as the exploration of the literature for the research unfolded the relationship described in Figure 2.1 (Chapter 2) crystallised. The researcher contends that this relationship and its description is novel and has not been documented before. Its contribution to having an effect on the poor performance rate of megaprojects is potentially significant.

The research does contribute to context. This claim is based on the perspective that the research relates specifically to the South African context for megaprojects and the relationship theory described has not been studied before. Often international studies within the context of the dissertation contain very few if any South African input, and the results are regularly standardised to South African conditions.

For his book on explaining the underlying causes for industrial megaprojects to be over-budgeted, delayed and not delivering on the business case, Merrow (2011) uses a global database of 318 projects. Of these 9% are from Africa. The 9% includes oil and gas developments from both North and West Africa and mainly minerals projects from Southern Africa (note not South Africa). The implication of this is that there is very limited representation of South African megaprojects in the database.

This research contributes by providing insight into the important and essential attributes that a sponsor should possess as key factor in megaproject success in the South African environment, a topic that has not received much attention in research publications.

Not only has the research crystallised from current literature a condensed set of essential (and larger set of important plus essential) attributes that can be assessed for prior to the appointment of a sponsor, these attributes can also readily be accommodated in one individual. Along with the minimum number of sponsor attributes that this research has produced, a guide to the types of assessment instruments (psychometric and other) that can be used in the identification of said attributes has also been developed.

The identification of the important and essential attributes is a contribution to executive management that could extend beyond the borders of South Africa. Although the research was based on South African case studies, it is good practice and nothing should prevent executive management globally from taking cognisance of the findings of this research in the appointment of a sponsor for any megaproject.

4.3 RESEARCH METHODOLOGY

4.3.1 Nature of the research

The research reflects a dominant behavioural science appearance, meaning the focus is on human action. There were regularly attempts to derive general conclusions about human behaviour as it related to society (Klemke, Hollinger & Kline, 1980). Similarly contextualised, behavioural science 'explores the cognitive processes within organisms and the behavioural interactions between organisms in the natural world' (Merriam-Webster, n.d.).

The 'dominant behavioural science appearance' statement is made because it relates to the aim of the research, being the identification of behavioural facets of an individual in the context of a megaproject. For the research the behavioural facets are the important and essential attributes and the individual is the megaproject sponsor. The research also relates to the migration of the front-end phase to the execution phase of megaprojects and the difference in philosophy between the two phases. The front-end phase is accordingly

described as the 'becoming' phase and the execution phase as the 'being' phase. This migration perspective allowed the researcher to incorporate a broader perspective to the ontological approach for the research (Morris, 2013).

For completeness, the philosophical basis for the research is confirmed as a realism-based ontological approach that migrates from an interpretivist post-modern 'becoming' to a positivist realism-based 'being' ontology. This migration within the ontological approach (from front-end to execution phase) occurs within an interpretivist (social constructivist) epistemological paradigm. The philosophical stance described recognises the value-laden and interpretive nature of much of the project management (management of projects) discipline knowledge.

4.3.2 Qualitative research methodologies frequently observed

Creswell (2013) identified five types of qualitative research that were most frequently observed in the social, behavioural and health science literature. These approaches were narrative research, phenomenology, grounded theory, ethnography and case study.

Brown (2008) corroborated the 'frequently observed' perspective of Creswell (2013). Brown stated that in the qualitative research domain, case studies were discussed as a notable qualitative methodology along with phenomenology, ethnography, biography (a subset of narrative research) and grounded theory (Brown, 2008; Creswell, 1998, 2003; Crotty, 1998; Denzin & Lincoln, 2005, 2008; Guba & Lincoln, 1994; Hatch, 2002; Mertens, 2005; Patton, 2002). Ospina (2004), in reflecting on qualitative research in the (new) leadership domain, identified qualitative designs described in the related literature as primarily being case study, ethnography, narrative enquiry, action research and grounded theory. Other than for phenomenology, the Ospina listing showed a distinct overlap with that of Creswell and Brown. Moriarty (2011) also argued for a wider and rigorous application of five theoretical frameworks within the social care research domain. These frameworks were grounded theory, case study, ethnography, life history or narrative approaches and conversation analysis. A distinct overlap with the work of Creswell (2013) was again evident. The researcher decided to utilise the Creswell 'frequently observed' methodologies to arrive at a methodology for the research. The reason for this was the width of application of the methodologies in the social science domain.

By considering the five most frequently observed methodologies it was apparent that the research met the requirements of the case study methodology best. This was corroborated by the work of Merriam (1998), Stake (1995, 2000, 2005) and Yin (2014). Along with Lincoln and Guba (1985), it was clear from the literature that Merriam, Stake and Yin played a strong thought leadership role in the domain of case study research. Validation for this

statement was found in the prominent references to Yin in Meyer (2001), Rowley (2002) and Saunders, Lewis and Thornhill (2009).

The case for the study contained the elements of a 'contemporary phenomenon' (Yin, 2014) and 'thing or single entity', i.e., a person (Merriam, 1998), being the sponsor of a megaproject. The sponsor was in this study in a real-life context as was required for a case study (Yin, 2014). The sponsor was also within an integrated system (Stake, 2005) that had boundaries or working parts (Merriam, 1998; Yin, 2014), being in this study the megaproject. The researcher had little to no control over the contemporary phenomenon (sponsor) and context (megaproject) as per the defined requirements for a case (Yin, 2014). The case study methodology makes provision for the event that a study needs to be based on multiple cases (which the research was). The constructivist (critical realist) epistemological paradigm of the researcher is aligned with that of Stake and Merriam. This provides additional motivation for the utilisation of the case study methodology.

The research revolves around an aim that deals with the determination of 'what' and 'which' important and essential attributes the sponsor of a megaproject should possess. The research aim is supplemented by research questions that contain a distinct number of 'how' and 'what' questions. The type of case study research used is the multiple-case study type where the researcher opted for multiple case studies to achieve the research aim. A number of megaprojects from multiple sites were identified for selection for study. The following section describes the design considerations for a multiple-case study type that the researcher considered and applied in the design of the research.

4.4 RESEARCH DESIGN

According to Yin (2014), the particularly important components of a case study research design were the:

- Questions of the case study;
- Propositions of the study;
- Unit(s) of analysis;
- Connecting of the data to the research questions; and
- Criteria or measures used to interpret the findings.

4.4.1 Questions and propositions of the case study

By reflecting on Figure 2.3 in Chapter 2 it can be deduced that the researcher developed a framework for this research that already integrates the first two important components of case study design as described by Yin (2014) above. This framework also reflects the research aim in addition to the research questions and propositions.

4.4.2 Unit(s) of analysis

The unit(s) of analysis component was strongly related to the problematic issues of defining the case and bounding the case being studied (Ragin & Becker, 1992; Yin, 2014). Flowing from considerations of how the research aim, research questions and propositions were formulated, the researcher identified the units of analysis for the research as the important and essential attributes to be possessed by the sponsor. These units of analysis were primarily bound within the persona of the sponsor.

Based on the findings of Merrow (2011) that 65% of megaprojects globally were classified as failures, the researcher originally decided to include seven cases in the research of which two were deemed successful and five as failed. Because of an increased level of discomfort experienced in allowing outsiders access to the key participants on one of the projects (deemed a failure by the researcher), the number of cases was reduced to six: Two successes and four failures. The six cases (with the potential to explore the important and essential attributes of a minimum of six sponsors) led to the research being categorised as a multiple-case study design. As is later described, there were ultimately substantially more than six sponsors in the selected projects.

The multiple-case study strategy incorporated multiple cases that were not bound in one critical case (Saunders et al., 2009; Yin, 2014). An additional rationale for using multiple cases in the research was the opportunity to determine whether the findings of the first case would occur in other cases (Saunders et al., 2009). A consequence of such an occurrence was the ability to generalise from such findings (Yin, 2014). The six cases were within the range of four to ten case studies required for the multiple-case study methodology (Easton, 2010; Eisenhardt, 1989). This provided sufficient possibility to recognise themes and perform an analysis of the themes present in the cases.

For replication of multiple case studies, Hersen and Barlow (1976) and Yin (2014) explained that the logic was akin to that used in multiple experiments. When discovering a significant finding in one experiment there would be a pressing need to replicate the finding by conducting more experiments. The original finding would only be considered robust if replicated in other experiments. By using multiple case studies, the underlying logic was the same.

Yin (2014) stated that including a formal design base for case study research had traditionally not been done, compared to performing survey or experimental research. However, Yin acknowledged that developing a case study design and considering which strategy to follow strengthened and most likely simplified case study research. To assist in developing a research case study design, Yin created a model in which comparing the single

case with multiple cases was one of two discrete dimensions to distinguish between four case study strategies. The other discrete dimension in the model was the differentiation between holistic (single unit of analysis) and embedded (multiple units of analysis). As previously indicated, the research aim is to identify the important and essential attributes of a sponsor on a megaproject. The units of analysis are thus the attributes (both important and essential) that a sponsor should possess. The fact that two discrete units (i.e., multiple units) of analysis were defined and multiple cases were used implies the design has both embedded and multiple-case characteristics. A graphic representation of the basic types of designs for case studies using the two discrete dimensions identified by Yin is provided in Figure 4.1.

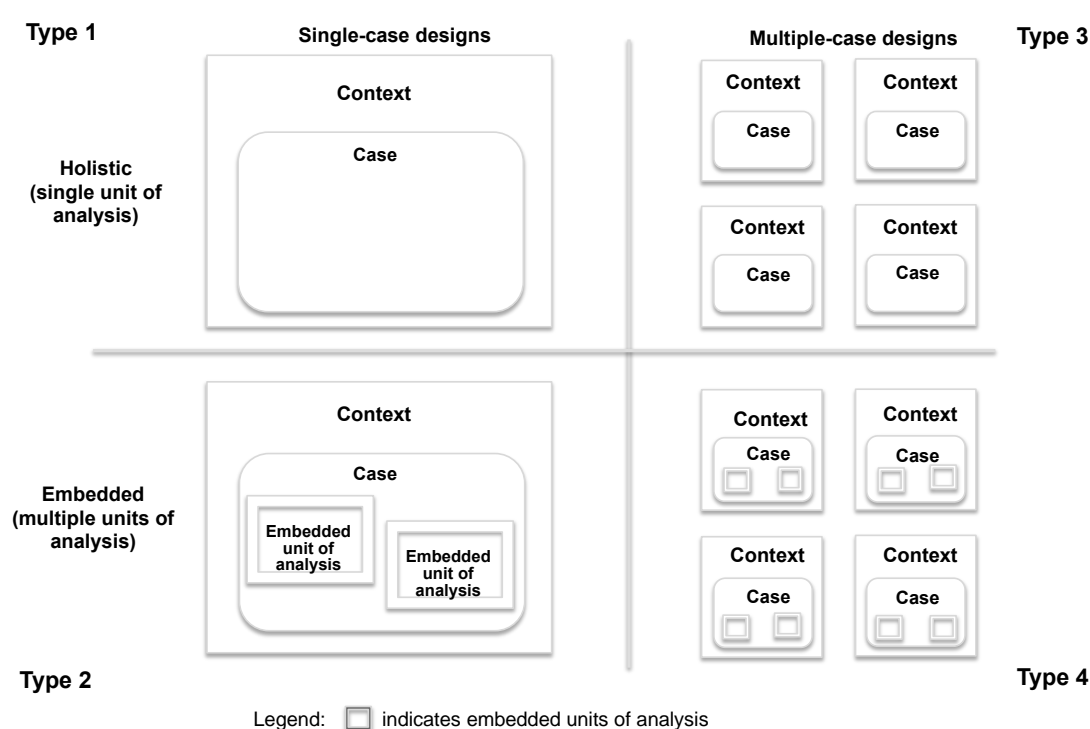


Figure 4.1: Basic types of design for case studies

Source: Yin (2014, p. 50)

As indicated in Figure 4.1, the research is a Type 4 design, i.e., an embedded multiple-case study design.

Although the aim of the research is the identification of important and essential attributes of the sponsor, the research design is bound at a macro level by the number of megaprojects within a context of multiple megaprojects selected. The researcher contends that it is, however, not only at the macro level that the design is bounded but even more so at the level of the sponsor. It is there where the attributes to be present needed to be identified.

The megaprojects selected for the research adhered to the following criteria:

- Megaprojects located in South Africa;
- Successful and failed megaprojects (as per the success or failure criteria described), with formally appointed sponsors;
- Private and public sector megaprojects with the public sector megaprojects mainly in the domain of infrastructure creation by state-owned enterprises (SOEs), some with profit motives;
- Industry sectors where megaprojects in South Africa were typically encountered, such as mining and minerals, energy (both electricity and petrochemical, chemical and fuels), telecommunications, and transport;
- Megaprojects with a value equal to or greater than ZAR10 billion/US\$1 billion at time of sanction of funds; and
- Megaprojects completed or commissioned since 2006, or under construction with significant progress achieved to allow an assessment of success or failure.

4.4.3 Basic principles of research design

In addition to the Introduction for this chapter (Section 4.1), Saunders et al. (2009, p.136) described research design as the general plan of how the researcher goes about answering the research question(s) whilst simultaneously emphasising the importance of clearly defining the research question(s). Yin (2014, p. 240) defined research design as a plan that logically linked the research questions with the evidence to be collected and analysed in a case study, ultimately circumscribing the types of findings that could emerge. Bryman and Bell (2007), Christensen (1997) and Lochner (2011) defined research design in a very similar manner. From these additional definitions, it was confirmed that the concept of research design revolved around the aspects of planning, collection and analysis of data and the linkage thereof to the research questions (and ultimately the research aim). Saunders et al. (2009) contended that to reduce the possibility of getting the answer wrong, particular emphasis needed to be placed on the reliability and validity of the research design.

Reliability was described as the extent to which the data collection techniques and analysis procedures deliver consistent findings. Differently put, it was about the consistency and repeatability of the research procedures used in a case study (Saunders et al., 2009; Yin, 2014). Reliability could be threatened by:

- Subject or participant error;
- Subject or participant bias; and
- Observer error.

Reliability was a term used for the testing, evaluation and measurement of quantitative research. However, Stenbacka (2001) stated that 'reliability' as a concept in the judgement

of quality had no relevance in qualitative research. Golafshani (2003) and Lincoln and Guba (1985) advocated the use of the term 'dependability' in qualitative research. This term closely aligned with the concept of reliability in quantitative research.

Validity in turn was defined as the extent to which findings are actually what they appear to be and whether the relationship between two variables is a causal relationship. Yin (2014) differentiated between external and internal validity. External validity was described as the extent to which the findings from a case study could be analytically generalised to other situations that were not part of the original study (Yin, 2014, p. 238). Internal validity was described as the strength of a cause-effect link made by a case study, partly determined by showing the absence of spurious relationships and the rejection of rival hypotheses (Yin, 2014, p. 239).

A third concept in reducing the error of findings was referred to as generalisability (sometimes referred to as external validity). It related to whether the findings from a particular study might be equally applicable to other research settings (Saunders et al., 2009).

Three functions described a 'good' research design specifically from a social science perspective (Denscombe, 2010; Lochner, 2011). These functions were:

- The research design clearly reflected the various components of the scientific investigation;
- The relationship between the research propositions and the research strategy was distinctly clear; and
- The interlinking of the various key components of the study was clearly visible.

4.4.4 Design considerations

Saunders et al. (2009) utilised the concept of an onion to reflect on the issues underlying the choices to be made regarding the design of the research, more specifically the data collection techniques and analysis procedures. This 'onion ring' concept is reflected in Figure 4.2.

4.4.4.1 Design philosophies

As reflected in Section 4.3.1, the philosophical basis for the research is a realism-based ontological approach that migrates over time from an interpretivist post-modern ('becoming') to a positivist realism-based ('being') ontology (Morris, 2013). It therefore implies that the researcher views the world from a positivism-, interpretivism- and realism-based philosophical perspective. This is accordingly highlighted in red in the onion ring diagram. Saunders et al. (2009) and Tashakkori and Teddlie (1998) supported the incorporation of multiple philosophical perspectives in a research philosophy. They suggested that for a

particular study it was more appropriate for the researcher to think of his/her adopted research philosophy as a continuum rather than opposites. Based on this thinking, the researcher arrived at the pragmatism research philosophy. Pragmatism contended that the research question was the most important consideration when designing the research method (Saunders et al., 2009). Pragmatism also contended that, if the research question did not unambiguously suggest a positivist or interpretivist philosophy, variations in ontology and epistemology could be accommodated. For the research, this perspective proved to be very valuable. It assisted *inter alia* in providing a logical explanation why the researcher considers the migration from an interpretivist (post-modern) to a positivist (realism-based) ontological approach over the lifecycle of the project so important.

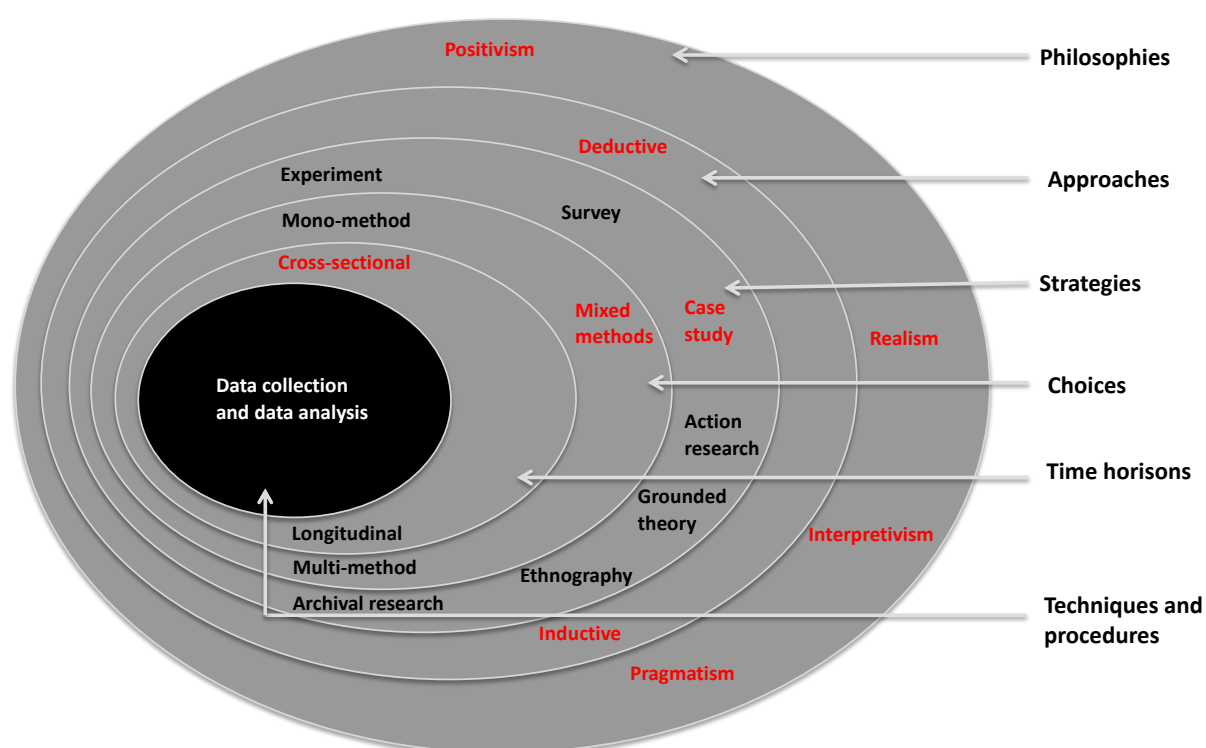


Figure 4.2: The onion ring concept of research design considerations

Source: Extracted from Saunders et al. (2009, p. 108)

4.4.4.2 Research approach

Saunders et al. (2009) stated that there were two dominant approaches to research, namely induction and deduction. The inductive approach implied that data was collected and the researcher then reflected on what theoretical themes the data was suggesting (as a result of the analysis of the data). The alternative was the deductive approach in which a theory and a hypothesis (or hypotheses) were developed and a research strategy was designed to test the hypothesis (or hypotheses). It should be noted that the inductive approach favoured the

collection of qualitative data compared to the deductive approach that favoured the collection of quantitative data (Saunders et al., 2009). Saunders et al., however, considered that it was possible to combine deduction and induction in the same research. In their experience, it was often found to be advantageous to do so.

After evaluating whether an inductive or a deductive approach would be appropriate for the study, the researcher opted for a combined inductive and deductive approach. The reasoning for this was that from the literature explored it was possible to develop a theoretical framework for the research, as is reflected in Figure 2.3 (Chapter 2). This framework is indicative of a deductive approach for the research design. Further work to support the deductive approach is found in Table 4.1 where linkages between relevant literature and the research questions (supporting the research aim) are demonstrated.

Table 4.1: Linkages between research questions and references in relevant literature

Research questions	References and keywords from literature
How is the potential megaproject sponsor identified and appointed and what are the attributes that he/she should possess?	Association for Project Management (APM) (2009, 2018) Barshop (2016) Bourne (2015) Office of Government Commerce (2007) Van Heerden, Steyn & Van der Walt (2015) Chapter 2 Keywords from literature: <ul style="list-style-type: none"> • Selection typically by board; • Nominated through governance process that failed to communicate adequately; • Executive or team of executives typically assigned sponsor; and • Sponsoring group identified senior responsible owner (sponsor).

Research questions	References and keywords from literature
<p>What are the attributes that the megaproject sponsor should possess?</p> <p>How do professionals in the field rank the relative importance of the attributes of megaproject sponsors (assuming not all the attributes are equally important)?</p>	<p>APM (2009, 2018) Barshop (2016) Crawford, Cooke-Davies, Hobbs, Labuschagne, Remington & Chen (2008a, 2008b) De Klerk (2014) Englund & Bucero (2006) Helm & Remington (2005) James, Rosenhead & Taylor (2013) Morris (2013) Pacelli (2005) Project Management Institute (PMI) (2014) Remington (2011) West (2010) Van Heerden et al. (2015) Chapter 2</p> <p>Keywords from literature:</p> <ul style="list-style-type: none"> • Broad array of descriptors used, e.g. attribute, behaviour, characteristic, skill, attitude, factor, capability, ability and criterion. 'Attribute' selected; • Attributes innate to persona of individual or obtained from experiential learning or formal education; • Appraisal of attributes suggested one individual unable to fulfil full spectrum; • Right teams could fulfil all attributes; • Possible to provide all attributes - rarely existed in one person; and • Recommended leadership characteristics or traits prescribed in literature unrealistically comprehensive and optimistic.
<p>Which important attributes of a sponsor on a megaproject are considered as essential for the project to be a success?</p>	<p>APM (2009, 2018) Barshop (2016) Crawford et al. (2008a, 2008b) Flyvbjerg (2014) PMI (2014) Chapter 2</p> <p>Keywords from literature:</p> <ul style="list-style-type: none"> • APM indicated 'continuity of the sponsor' as one of three critical attributes. Similarly, Barshop emphasised 'continuity of the sponsor'; and • Of similar nature was 'appropriate seniority and positional power'. <p>The following characteristics of megaprojects were regularly overlooked:</p> <ul style="list-style-type: none"> • Very regularly led by (business) managers and planners without significant experience; • Business managers and planners regularly replaced during lengthy project lifecycle of megaprojects, resulting in weak leadership; and • Non-provision for complexity and extreme events led to cost overruns, time delays and inability to meet requirements of business case.

Research questions	References and keywords from literature
<p>Why are certain attributes of the sponsor on a megaproject defined as important?</p> <p>Which important attributes of a sponsor on a megaproject are considered as essential for the project to be a success?</p>	<p>APM (2009, 2018) Flyvbjerg (2014) Chapter 2</p> <p>Keywords from literature: Individual required five key personal attributes to be successful as sponsor:</p> <ol style="list-style-type: none"> 1. Understanding the role, significance and project context; 2. Competence in having knowledge, personal attitude and skills to fulfil role, as it relates to providing clarity of direction within strategy and governance arrangements of organisation; 3. Credibility in terms of being accepted by stakeholders as suitable for role; 4. Commitment by giving the role the personal time and priority necessary; and 5. Engagement by being willing to take personal ownership, ensuring effective communications and being able to influence people. <p>The following characteristics of megaprojects were regularly not considered or overlooked:</p> <ul style="list-style-type: none"> • Megaproject method of delivery (presented randomly) determined high risks with overexposure to extreme events with potential of having significant negative outcomes. Often ignored by (business) management; and • Statistical evidence indicated that complexity and extreme events not provided for resulted in inadequate cost and time contingency provisions.
<p>Which psychometric and other tests can reliably assess important attributes of a potential megaproject sponsor?</p>	<p>Belbin (2010a, 2010b) Gardner, Coglisser, Davis & Dickens (2011) Kernis & Goldman (2005, 2006) Porter (1976, 1996) Chapter 2</p> <p>Keywords from literature:</p> <ul style="list-style-type: none"> • Personality traits: Belbin Team Role model and Relationship Awareness Theory (Strength Deployment Inventory); and • Practical applications of the measurement of leadership traits (Transnet SOE): Capability, management competence, reasoning ability, emotional intelligence, personality, workplace integrity.

Research questions	References and keywords from literature
What should the level of active participation of a megaproject sponsor ideally be in order to make a decisive impact on the success of the project?	<p>APM (2009, 2012, 2018) Englund & Bucero (2006) PMI (2012, 2013a, 2013b, 2014) West (2010) Chapter 2</p> <p>Keywords from literature:</p> <ul style="list-style-type: none"> • Sponsorship described as an active senior management role; • Organisations with active sponsors on at least 80% of their projects had a success rate of 75%; and • Sponsor who actively supported project was 2nd most important factor indicating greatest impact on success of highly complex projects.

To fully achieve the research aim, it was necessary to identify whether there were no facets in the context of sponsor attributes that had not been revealed by literature or by human interaction. What was very likely in this context was that such unknowns would be of a social science and qualitative nature, and would very likely be identified via human interaction. Such identification was indicative of the need for an inductive approach to the research design.

The researcher finally notes that a combination of the deductive and inductive approaches to the research design was supported within the pragmatism philosophical context (Saunders et al., 2009). Therefore, the decision was made to follow a combined approach.

4.4.4.3 Research strategy

The research strategy selected for the study was the case study strategy as has been indicated in Section 4.3.2. Both Robson (2002) and Yin (2014) highlighted the importance of context in their respective definitions of a case study. Particularly so by Yin, who emphasised that the borders between the case being studied and the context in which it was studied, were generally not clearly visible. The researcher contends that this is pertinent to the identification of the important and essential attributes possessed by the sponsor. In large-scale, complex or complicated megaprojects, involving multiple public and private stakeholders, as in this research, the borders between the cases and their context were at times rather nebulous, particularly for the identification and appointment of the sponsor.

The research, because of its exploratory nature and asking very specific ‘what’ and ‘how’ questions regarding the important and essential attributes to be possessed by the sponsor, aligned itself very comfortably with the case study methodology or strategy.

4.4.4.4 Research method choices and time horizons

Saunders et al. (2009) made the point that individual quantitative and qualitative techniques and procedures did not exist in isolation. When deciding on research methods to achieve the research aim, Saunders et al. were of the opinion that either a single data collection technique and corresponding procedure of analysis or more than one data collection technique and procedure of analysis could be used. This was commonly referred to as the mono method compared to the multiple methods decision. For multiple methods, the researcher could hypothetically choose to use both questionnaires and structured observation to collect quantitative data, and then utilise statistical procedures to analyse the data. This was referred to as a multi-method quantitative research study.

Where in-depth interviews and diary accounts were used to collect qualitative data and qualitative non-numerical procedures were used to analyse the data, it was referred to as a multi-method qualitative research study. Where both quantitative and qualitative techniques and procedures were used for data collection and analysis, it was referred to as a mixed methods approach. For this research, the researcher used open-ended semi-structured interviews (supplemented by a survey questionnaire) and a focus group to collect primary qualitative data. Secondary qualitative data was collected from archived documents or records and data available in the public domain. The primary data emanating from the interviews was analysed using ATLAS.ti Computer Assisted Qualitative Data Analysis (CAQDA) software as is discussed at the end of the data collection and analysis section of this chapter. The results from the questionnaire and the focus group were analysed respectively by quantitative and qualitative non-numerical procedures. For the study, the researcher accordingly adopted a hybrid multi-method qualitative/ mixed method approach as research method of choice.

Bryman (2006) found that the predominant research methods and designs employed for quantitative research tended to be structured interview and questionnaire research within a cross-sectional design. For qualitative research within a cross-sectional design, it tended to be semi-structured interview research. Cross-sectional design implied the study of a particular phenomenon at a particular time and was commonly referred to as the 'snapshot' time horizon. The longer diary-based time horizon was referred to as the longitudinal time horizon.

Interviews could also be employed for cross-sectional qualitative cases when the study needed to be done over a relatively short period of time (Easterby-Smith, Thorpe, Jackson and Lowe, 2012; Robson, 2002; Saunders et al., 2009). Saunders et al. (2009) confirmed the acceptability of cross-sectional studies using qualitative methods. The researcher considered the identification of attributes as an action that took place at a particular time,

therefore selected the cross-sectional time horizon with the focus on semi-structured (open-ended) interviews, supplemented by the use of a survey questionnaire and a focus group activity.

4.4.4.5 Summary of research design

Prior to embarking on further elaboration of data collection and analysis for the study, the research design, as per the analogy of the research 'onion ring' of Saunders et al. (2009), is summarised as follows:

- **Philosophies:** Pragmatism with facets of positivism, realism and interpretivism included;
- **Approach:** Combined inductive and deductive approach;
- **Strategy:** Case study with an embedded (multiple units of analysis) multiple-case design; and
- **Method choice and time horizon:** Hybrid multi-method qualitative and mixed method approach (open-ended semi-structured interviews, supplemented by a survey questionnaire and a focus group activity) with a cross-sectional time horizon.

By reflecting on the summary of the research design above and Figure 2.3 (Chapter 2), it is apparent that the design of the research adequately meets the requirements of a 'good' design as per Denscombe (2010) in Section 4.4.1.

4.4.5 Connecting the data to the propositions

Within the context of data collection and analysis, Meyer (2001), Rowley (2002), Saunders et al. (2009) and Yin (2014) stated that preparation needed to be done before the action of data collection commenced as follows:

- Ensuring the case study investigator possessed the desired skills (referred to as 'competence' by Rowley, 2002) and values to conduct the interviews;
- Training for doing the case study performed;
- Developing a protocol for the study;
- Screening of candidate cases; and
- Conducting a pilot study.

The researcher adhered to all of the above with the exception of preparing a protocol for each of the case studies forming part of the research, since the overall framework for the research - as in Figure 2.3 (Chapter 2) - served this purpose quite adequately.

The data collection questions (strongly influenced by the research questions) were contained in interview guides (per level, i.e., executive management, sponsor and project manager) and used during the semi-structured interviews. Rowley (2002) and Yin (2014) advised that during the interviews the interviewer should not only concentrate on the

questions directed at the interviewees but also on the questions directed at the researcher by the interviewees pertaining to the specific case.

4.4.5.1 Candidate cases and selection of cases for the research

The most complete source of megaproject data for the South African context was found to be the South Africa-based Creamer Media *Research Channel Africa* publication that provided a weekly update of projects in progress. Each week, Creamer Media added information on several new industrial and mining projects to its publication. Updated information was also provided for projects that were being tracked. Creamer Media also published annual *Project in progress* special reports. These reports provided an update of the largest industrial (including infrastructure) projects in the engineering (electricity, petrochemicals, oil and gas, transport, water, and renewable-energy independent power producer procurement programme) and mining (coal, diamonds, gold and platinum) sectors.

An analysis was done of the presence of megaprojects (industrial, including infrastructure with a profit motive) in the South African context in the above publications. The analysis indicated that 10 projects qualified to be included in the case study. These 10 projects all met the ZAR10 billion/US\$1 billion threshold as defined by Merrow (2011) and Flyvbjerg (2014) for megaprojects. The projects are summarised in Table 4.2.

**Table 4.2: Megaprojects completed in South Africa since 2006
with value greater than ZAR10 billion/US\$1 billion**

Name	Private or public sector: Owner	Industry sector	Successful or failed	Cost update (early 2019) (ZAR billion)
1. Kusile coal-fired power station	Public sector: Eskom	Energy, power	Failed ¹	161,4
2. Medupi coal-fired power station	Public sector: Eskom	Energy, power	Failed ²	145,0
3. Gautrain rapid-rail link project	Public sector: Gauteng Provincial Government	Transport, rail	Successful ³	28,1
4. Ingula pumped-storage scheme project	Public sector: Eskom	Energy, power	Failed ⁴	35,9
5. New multi-product pipeline (NMPP) project	Public sector: Transnet	Transport, pipeline	Failed ⁵	30,4
6. Gauteng freeway improvement project	Public sector: Sanral	Transport, roads	Failed ⁶	20,6
7. Growth programme for Synfuels Secunda facility	Private sector: Sasol	Petrochemical	Failed ⁷	14,2

Name	Private or public sector: Owner	Industry sector	Successful or failed	Cost update (early 2019) (ZAR billion)
8. Fischer-Tropsch wax expansion project (FTWEP)	Private sector: Sasol	Chemical	Failed ⁸	13,6
9. Styldrift 1 expansion platinum project	Private sector: Royal Bafokeng Platinum (67%) & Anglo American Platinum (33%)	Mining	Failed ⁹	11,0
10. Collieries replacement/ expansion programme	Private sector: Sasol	Mining	Successful ¹⁰	15,3

Table endnotes:

1. Failed on cost, schedule and operability criteria (as initially sanctioned by the Eskom board). Information gleaned from public domain media sources. Not selected as a case for research.
2. Failed on cost, schedule and operability criteria (as initially sanctioned by the Eskom board). Information gleaned from public domain media sources. Not selected as a case for research.
3. Did not fail on cost, schedule or operability criteria (as finally sanctioned by Gauteng Provincial and National governments). Information gleaned from interviews and public domain media sources. Selected as a case for research.
4. Failed on cost, schedule and operability criteria (as initially sanctioned by Eskom board). Information gleaned from interviews and public domain media sources. Selected as a case for research.
5. Failed on cost and schedule criteria (as initially sanctioned by Transnet board). Assessment of operability criterion is work-in-progress. Information gleaned from interviews and public domain media sources. Selected as a case for research.
6. Failed on cost and schedule criteria (as initially sanctioned by Sanral board). Information gleaned from public domain media sources. Not selected as a case for research.
7. Did not fail on cost or operability criteria but failed on schedule criterion (as initially sanctioned by Sasol board). Information gleaned from interviews and public domain media sources. Selected as a case for research.
8. Failed on cost and schedule criteria but not on operability criterion (as initially sanctioned by Sasol board). Information gleaned from interviews and public domain media sources. Selected as a case for research.
9. Failed on cost and schedule criteria (as initially sanctioned by the Royal Bafokeng Platinum and Anglo American Platinum boards). Detail on operability criterion not available. Information gleaned from public domain media sources. Not selected as a case for research.
10. Did not fail on cost, schedule or operability criteria (as initially sanctioned by Sasol board). Information gleaned from interviews and public domain media sources. Selected as a case for research.

From the 10 projects in Table 4.2, six projects were selected. This created a 50/50 private-public sector split. The industry sectors represented were mining and minerals (specifically coal), energy (fuels and chemicals, i.e., wax from natural gas), transport (rail and pipeline) and energy (pumped-storage power generation). Using cost, schedule and operability information available in the public domain, four failed and two successful megaprojects were included in the multiple-case study design. As previously explained, this resulted in a 67/33% failed-successful split that was reasonably similar to what Merrow (2011) indicated in terms of a global norm for failed megaprojects, i.e., 65/35% failed/successful.

The megaprojects included in the multiple-case study design are indicated in Table 4.3.

Table 4.3: Megaprojects included in research

Title of project	Owner
1. Ingula pumped-storage scheme project	Eskom
2. Gautrain rapid-rail link project	Gauteng Provincial Government through Gautrain Management Agency
3. NMPP project	Transnet
4. FTWEP	Sasol
5. Growth programme for Synfuels Secunda facility	Sasol
6. Collieries replacement/ expansion programme	Sasol

The rationale for not including all 10 projects in the research was that six projects (cases) were in the range of four to 10 cases that was required for a multiple-case study design. If all 10 projects were to be included, it would unbalance the private-public sector split to 40/60%. The Medupi and Kusile coal-fired power station projects were very similar projects by the same owner organisation (Eskom) and it was reasoned that to include only one would be sufficient. However, access to these projects was denied and the number of cases was reduced to a possible eight in total. Lastly, it was argued that the inclusion of a transport (road) case (the Gauteng freeway improvement project) and another mining and minerals (platinum) case (the Styldrift 1 expansion platinum project) would not necessarily enrich the industry-sector distribution of the cases. Due consideration was given to the potential inclusion of these cases at a later stage if required. In the event that some of the cases included did not make the contribution foreseen for the recognition of themes present in the cases, one of the cases would have been added to the cases selected.

4.4.5.2 Pilot case study

Saunders et al. (2009) and Yin (2014) asserted that performing a pilot case study assisted in the refinement of data collection plans in terms of the content of the data and the procedures for data collection to be followed. Yin (2014) placed emphasis on the fact that a pilot test was not a pre-test. The pilot case study supported the development of lines of questioning,

and potentially provided conceptual clarification for the design of the research. The pre-test differed from the pilot test in that a pilot test was an opportunity for rehearsing the data collection plan to determine how far it would differ from the intended final plan.

The selection of a pilot case study was mainly determined by the following criteria (Meyer, 2001; Yin, 2014):

- Convenience in terms of availability of individuals and documentation;
- Ease of access for the researcher;
- Geographic proximity in terms of distance to be travelled by the researcher;
- Pre-understanding of the context of the case; and
- Prior personal contact by the researcher with key individuals on the project.

A pilot case study was used in the research to validate the appropriateness of the survey guide questions, to improve the plans for data collection, and to determine the effective line of questioning (Yin, 2014). These objectives were achieved. Given the relative infrequent occurrence of megaprojects, the project for the pilot case study (the Fischer-Tropsch wax expansion project of Sasol) was selected from the six projects forming the basis for the multiple-case study research. The pilot case study consisted of an interview with the pilot case study participants. The same participants who participated in the interviews for the pilot case study also completed the survey questionnaire described above.

All the interviewees for the pilot case study considered the survey guide questions to be appropriate. However, some interviewees indicated a need for more questions to determine who would make a good sponsor, and how adequately the selected sponsor had been prepared for the role. The interview guide was adjusted accordingly.

The pilot case study also contained distinct facets of pre-testing in that it not only focused on the development of lines of questioning for the research design but also provided an opportunity for rehearsing the data collection plan.

The researcher, a former employee of Sasol, was very cognisant of the fact that three (out of six) megaprojects from one organisation (Sasol) were included in the number of projects studied. The researcher retired from Sasol at the end of 2011. During his career at Sasol the researcher was not involved in any of the studied projects as a project team member. He also did not have direct Sasol management responsibilities for any of the sponsors or project managers mentioned in the research.

Not all three Sasol projects were successful (two failures and one success), as indicated in Table 4.2. There were differences in application of methodologies but that was not peculiar in a large corporate organisation. The researcher ensured that the guidelines provided by Saunders et al. (2009) and Yin (2014) were firmly adhered to. These guidelines were:

- Ask probing questions (particularly during the interviews) and ensure the answers were fairly interpreted;
- Listen acutely and do not fall into the trap of preconceived concepts. Listen between the lines;
- Remain adaptive and view new situations as opportunities, not threats;
- Have a good understanding of the aspects being studied; and
- Be sensitive to evidence that was contrary and conduct the research in an ethical manner. Examine the evidence from varied perspectives.

Finally, in all three Sasol projects a number of the interviewees (eight out of 15) had either retired or moved on to other organisations. The probability of these individuals needing to protect their interests or careers, and thus being hesitant to share information freely was reduced significantly. This manifested during the interviews when they shared information openly on why the projects were either successes or failures. The interviews with those currently employed by Sasol were somewhat more reserved.

4.4.5.3 Data collection procedures

Creswell (2013), Meyer (2001), Rowley (2002) and Yin (2014) recommended multiple forms of data collection for case studies. These forms were:

- Documents;
- Records from archives;
- Interviews;
- Questionnaires;
- Direct observations;
- Participant observation; and
- Physical artefacts.

For this study, the records from archives included both publicly available open data sources as well as data obtained from the participants interviewed for the research. Data available in the public domain was sourced from news articles, project reports and press releases as present on websites, national technical, engineering and construction journals and project management publications. The data obtained from the interviewees included minutes of meetings, company project progress reports and company applications for funding of projects.

For the research the primary form of data collection was semi-structured interviews (and the subsequent survey questionnaire) supplemented by a focus group activity. The focus group activity was conducted to determine firstly whether the attributes of sponsors differed between industry sectors. Secondly, the focus group was used to determine whether the

attributes profile of a sponsor differed between megaprojects and other relatively large projects. The focus group activity was held with eight out of a possible 15 key players representing the three Sasol cases.

The size of the focus group (eight participants), the use of a skilled facilitator (the researcher), and a flexible semi-structured dialogue between the members of the group in a convenient location met the requirements for an optimised configuration (six to 12 participants) for a focus group activity, as advised by several authors (Brockman, Nunez & Basu, 2010; Fusch & Ness, 2015; Jayawardana & O'Donnell, 2009; Packer-Muti, 2010).

The researcher moderated the focus group discussion. The views of the participants on whether the type of industry would influence the attributes required by the sponsor on a megaproject were obtained. Similarly, their views on the attributes to be possessed by the sponsor in a megaproject compared to another relatively large project context were also obtained.

4.4.5.4 *Semi-structured interviews*

Primary data was collected per case (megaproject) via semi-structured, open-ended interviews at three organisational levels (board or executive management, sponsor and project manager). Interviewees with very specific roles (board or executive management appointing the sponsor, the sponsor self and the project manager) were included in the interview process to cover a broad array of knowledge and perspectives. The objective was to identify convergence and divergence in perspectives and opinions to ensure implicit rigour and validity of data obtained (Eisenhardt & Graebner, 2007; Lehtinen, Aaltonen & Rajala, 2017).

Semi-structured interviews using open-ended questions were conducted to obtain both retrospective and real-time accounts from those participants who were experiencing or had experienced the issue at hand, i.e., perspectives on the attributes of the sponsor (Gioia, Corley & Hamilton, 2013; Lehtinen et al., 2017). Semi-structured interviews were considered a valid method for case study design and qualitative research offering the benefits of flexibility and the lack of input bias (Bryman & Bell, 2007).

The interviews were held with project participants as indicated above. Megaprojects typically experienced an inordinately long duration (longer than 10 years) from the beginning of the front-end to the conclusion of the execution phases. Inevitably, during this period, organisational changes occurred that influenced the availability of the individuals in key positions on the project. To accommodate these changes in the research, it was necessary to interview more than one individual at the respective levels on some of the megaprojects.

The open-ended questions were directed at obtaining information on the research questions, i.e., those questions that focus on generating data to support achievement of the research aim.

4.4.5.5 Preparation for and implementation of the semi-structured interviews

Different interview guides were developed for the respective organisational levels.

The interview guides are appended for the:

- Member of the board or executive management of the organisation responsible for appointment of the sponsor (Appendix A);
- Sponsor appointed on a megaproject (Appendix B); and
- Project manager appointed on a megaproject (Appendix C).

The linking of the interview questions to the research questions via references to the appropriate literature and keywords in the literature is depicted in Table 4.4.

Table 4.4: Linkages between interview questions, references to literature and research questions

Interview questions	References and keywords from literature	Research questions
<p>How was the sponsor for the project identified and appointed? (board or executive management)</p> <p>How were you identified and appointed as the sponsor on the project? (sponsor)</p>	<p>APM (2009, 2018) Barshop (2016) Bourne (2015) OGC (2007) Van Heerden et al. (2015) Chapter 2</p> <p>Keywords from literature:</p> <ul style="list-style-type: none"> • Selection typically by board; • Nominated through governance process that failed to communicate adequately; • Executive or team of executives typically assigned sponsor; and • Sponsoring group identified senior responsible owner (sponsor). 	<p>How is the potential megaproject sponsor identified and appointed and what are the attributes that he/she should possess?</p>

Interview questions	References and keywords from literature	Research questions
<p>What do you consider the array of attributes that a sponsor on a megaproject should possess? (All interviewees)</p> <p>How would you rank these attributes, assuming all the attributes are not equally important? (All interviewees)</p>	<p>APM (2009, 2018) Barshop (2016) Crawford et al. (2008a, 2008b) De Klerk (2014) Englund & Bucero (2006) Helm & Remington (2005) James et al. (2013) Morris (2013) Pacelli (2005) PMI (2014) Remington (2011) Van Heerden et al. (2015) West (2010) Chapter 2</p> <p>Keywords from literature:</p> <ul style="list-style-type: none"> • Broad array of descriptors used, e.g. attribute, behaviour, characteristic, skill, attitude, fact, capability, ability and criterion. 'Attribute' selected; • Attributes innate to persona of individual or obtained from experiential learning or formal education; • Appraisal of attributes suggested one individual unable to fulfil full spectrum; • Right teams could fulfil all attributes; • Possible to provide all attributes - rarely existed in one person; and • Recommended leadership characteristics or traits prescribed in literature unrealistically comprehensive and optimistic. 	<p>What are the attributes that the megaproject sponsor should possess?</p> <p>How do professionals in the field rank the relative importance of the attributes of megaproject sponsors (assuming not all the attributes are equally important)?</p>

Interview questions	References and keywords from literature	Research questions
<p>Which of the mentioned important attributes possessed by the sponsor would you consider as essential for project success? (All interviewees)</p> <p>Why do you consider these attributes as essential for project success? (All interviewees)</p> <p>How successful (or not) do you consider the project to have been and why? Please utilise in your response the following thresholds for failure:</p> <ul style="list-style-type: none"> • Cost overrun > 25%; • Slip in execution schedule > 25%; and • Production versus plan i.e., significantly reduced production into year 2. (All interviewees) 	<p>Crawford et al. (2008a, 2008b) APM (2009, 2018) PMI (2014) Flyvbjerg (2014) Barshop (2016) Chapter 2 in research</p> <p>Keywords from literature:</p> <ul style="list-style-type: none"> • APM indicated 'continuity of the sponsor' as one of three critical attributes. Similarly, Barshop emphasised 'continuity of the sponsor'; and • Of similar nature was 'appropriate seniority and positional power' (Crawford et al., 2008a, 2008b). <p>The following characteristics of megaprojects were regularly overlooked (Flyvbjerg, 2014):</p> <ul style="list-style-type: none"> • Very regularly led by (business) managers and planners without significant experience; • Business managers and planners regularly replaced during lengthy project lifecycle of megaprojects resulting in weak leadership; and • Non-provision for complexity and extreme events led to cost overruns, time delays and inability to meet requirements of business case. 	<p>Which important attributes of a sponsor on a megaproject are considered as essential for the project to be a success?</p>

The format of the interview guides followed an approach in which a few introductory questions were asked to initiate the interview. This was followed up with further questions to deal with the aim of the research. The interviews were concluded with questions directed at a reflection on the megaproject. This included an enquiry by the researcher whether there were any other issues that the interviewees would like to raise.

Half of the questions in the interview guide explored the important and essential attributes of a sponsor of a megaproject in a neutral manner, i.e., not project-specific. These non-specific questions probed the 'what' and the 'why' for important and essential attributes.

For the other half of the questions the views of the interviewees were solicited for project-specific issues such as:

- How the potential sponsor was identified and appointed;
- The reaction of the sponsor to unforeseen circumstances;

- Psychometric and other tests that could be used to reliably assess the important attributes of the sponsor;
- The level of active participation and continuity of the sponsor whilst on the project; and
- The success (or not) of the project measured with criteria as described by Merrow (2011).

Interviews for the six megaprojects selected for the study were conducted with the following participants whose details are shown in Table 4.5. Further descriptions of their work experience are available in Appendix E. In total 26 individuals were interviewed.

Table 4.5: Details of participants per project

Project title (and owner)	Title and role of participant on the project
Ingula pumped-storage scheme project (Eskom)	<ul style="list-style-type: none"> • Senior Executive (acting) Group Capital Division: Representative of the board or executive management responsible for appointment of sponsor • Alternative Energy Divisional Executive: Sponsor • Project Director: Project manager <p>For the Eskom project, interviews were also conducted with:</p> <ul style="list-style-type: none"> • Senior Manager responsible for the Eskom Project Management Office; and • Senior Manager responsible for Capability Assessment and Diagnostics within Eskom.
Gautrain rapid-rail link project (public-private partnership between the Gauteng Provincial Government and the Bombela international consortium, now managed by Gautrain Management Agency (GMA))	<ul style="list-style-type: none"> • Chairman of Inter-governmental Steering Committee also representing National Treasury: Representative of the board or executive management responsible for appointment of sponsor • Project Leader and CEO of GMA: Sponsor • Project Coordinator: Project manager
NMPP project (Transnet)	<ul style="list-style-type: none"> • Group Chief Capital Officer: Representative of the board or executive management responsible for appointment of sponsor • Managing Director Transnet Capital Projects, now retired: Sponsor • General Manager Project Execution, now retired: Project Manager
FTWEP (Sasol)	<ul style="list-style-type: none"> • Executive Director Sasol (Ltd), currently CEO of Nampak: Representative of the board or executive management responsible for appointment of sponsor • Executive Vice President Sasol Southern African Operations: Representative of the board or executive management responsible for appointment of sponsor • Managing Director Sasol Wax, now retired: Sponsor 1 • Senior Vice-President Sasolburg Operations, Sasol: Sponsor 2 • Project Director Sasol Group Technology: Project manager

Project title (and owner)	Title and role of participant on the project
Growth programme for Synfuels Secunda facility (Sasol)	<ul style="list-style-type: none"> • Group Executive responsible for Sasol Synfuels, now retired: Representative of the board or executive management responsible for appointment of sponsor • Group General Manager dedicated to Synfuels Growth Programme, now retired: Sponsor 1 • General Manager, Group Production Optimisation, currently Senior Vice President, Secunda Synfuels Operations: Sponsor 2 • Technical Director/Engineering Manager, now retired, reporting to Project Director (since deceased): Project manager
Collieries replacement/ expansion programme (Sasol)	<ul style="list-style-type: none"> • Executive Vice President Sasol Upstream and Business Enablement, now retired: Representative of the board or executive management responsible for appointment of sponsor • Managing Director Sasol Mining, currently Senior Vice-President Sasol SH&E: Positional sponsor 1 • Managing Director Sasol Mining, currently CEO of Harmony Gold Mining Company: Positional sponsor 2 • Vice President: Mining Services Sasol Mining: Operational sponsor 1 • Vice President Sigma and Innovation Sasol Mining: Operational sponsor 2 • Project Director Sasol Mining, now retired: Project manager

Immediately after completion of a semi-structured, open-ended interview, each interviewee (survey respondent) was requested to complete a survey questionnaire that contained all the attributes identified from literature. The survey questionnaire contained a list of 32 attributes identified from literature and is reflected in Table 2.4 (in Chapter 2). As background to the survey questionnaire, each respondent was reminded that it was very unlikely that a single individual would be able to fulfil the full spectrum of attributes. The optimum number of essential attributes a sponsor should possess appeared to be seven (APM, 2009, 2018; Barshop, 2016; Bourne, 2015; De Klerk, 2014; Englund & Bucero, 2006; Helm and Remington, 2005; Pacelli, 2005; PMI, 2014; Valencia, 2007; West, 2010; Zaccaro, Kemp & Bader, 2004). The survey respondents were also invited to add any other attribute not listed in the survey questionnaire.

The survey respondents were requested to identify a number of important attributes from the survey questionnaire. The term 'important' was defined for the respondents as 'having serious meaning or worth, i.e., 'deserving or requiring serious attention' (Merriam-Webster, n.d.). The reason for identifying the important attributes was coupled with the full spectrum of attributes required by the sponsor to be effective in the role.

The survey respondents were (as part of the survey) additionally requested to identify from the important attributes a number of essential attributes. The term 'essential' was defined as 'so important as to be indispensable' (Merriam-Webster, n.d.). The reason for identifying essential attributes was coupled with those attributes required by the sponsor to improve the

probability of project success. The implication was that all essential attributes would be important but not all the important attributes would be essential.

The respondents were required to apply their minds to the difference between the terms 'essential' and 'important' when voting. The definitions of the terms were shared and discussed with each respondent before the interview commenced, during the interview and again just after the completion of the interview. During these discussions it was emphasised that some important attributes were more important than others; those would be the essential attributes. The data collected from the survey questionnaires and the interviews used this classification of 'important' and 'essential' and the subsequent analysis thereof were the foundations for Chapters 5 and 6.

In the context of the megaproject, the 'normal' human being had a limited capacity and a reasonable expectation was for an individual to possess five to 10 sponsor attributes, with seven being the practical number (APM, 2009, 2018; Barshop, 2016; Bourne, 2015; De Klerk, 2014; Englund & Bucero, 2006; Helm and Remington, 2005; Pacelli, 2005; PMI, 2014; Valencia, 2007; West, 2010; Zaccaro et al., 2004).

This number seven and the expectation of a range of five to 10 attributes to be possessed by the 'normal' human was deduced from the following data.

Table 4.6: Number of attributes identified by various authors

Author	Number of attributes identified
Zaccaro, Kemp & Bader (2004)	6
Helm & Remington (2005)	10
Pacelli (2005)	10
Englund & Bucero (2006)	5
Valencia (2007)	7
West (2010)	10
De Klerk (2014)	7
PMI (2014)	5
Bourne (2015)	5
Barshop (2016)	6
APM (2009, 2018)	5
Average¹	7
Range	5 to 10

Table endnote:

1. Valencia (2007) commented in regards to the number of attributes selected that the attribute list needed to be manageable (in numbers) in order for it to be usable. The researcher in this context replaced the term 'average' with 'practical'.

4.4.6 Criteria or measures used to interpret findings

4.4.6.1 Data saturation and triangulation

If data saturation was not reached the quality of the research performed was impacted and the validity of the content of the research was affected negatively (Bowen, 2008; Fusch & Ness, 2015; Kerr, Nixon & Wild, 2010). Fusch and Ness (2015), O'Reilly and Parker (2012) and Walker (2012) argued that data saturation was achieved when enough information existed to replicate the research. They further argued that when the ability to obtain additional new information and additional coding were not attainable (Guest, Bruce & Johnson, 2006), data saturation was confirmed. Gaskell (2000) and Green and Thorogood (2004) supported the notion of 'nothing new'.

O'Reilly and Parker (2012) cautioned that saturation should only be considered as a quality marker for qualitative research, i.e., saturation was confirmed if accompanied by the recognised qualitative research marker of transparency. Transparency described the inclusion of sufficient detail on how the data for the research was collected and disseminated to determine how or why saturation has been achieved (Caelli, Ray & Mill, 2003; Meyrick, 2006; O'Reilly & Parker, 2012). Transparency was challenging to achieve given that guidelines were limited for the research community to utilise (Francis, Johnston & Robertson, 2010; O'Reilly & Parker, 2012; Ziebland & McPherson, 2006). Transparency of the process of data collection and dissemination was, however, crucial to ensure that qualitative research quality was achieved during data dissemination (O'Reilly & Parker, 2012).

Triangulation was the researcher's use of external methods to generate and analyse multiple sources of data (Denzin, 2009; Fusch & Ness, 2015). Fusch and Ness (2015) stated that:

- A direct relationship existed between data saturation and data triangulation;
- Data triangulation corroborated data saturation; and
- Through data triangulation the researcher arrived at data saturation.

In this context, the use of 26 interviews for the research and the accompanying survey questionnaires resulted in data saturation being achieved. Data saturation already occurred during the processing of the data from the 22nd and 23rd interviews and survey questionnaires. The addition of a 27th interview and its accompanying questionnaire to the number of interviews conducted confirmed that no new insight was generated. This interview was conducted with a member of executive management of a paper and pulp manufacturer with a project completed nearly in the league of megaprojects as defined. For most research, where the objective was to understand common perspectives and experiences among a group of individuals that were relatively homogeneous in nature, 12 interviews would be sufficient (Guest et al., 2006).

The use of the focus group activity also did not add new information. From a data triangulation perspective, the interviews were analysed with the use of ATLAS.ti and the survey questionnaire through a bottom-up numerical analysis. Themes or patterns within data could be identified either in an inductive bottom-up or in a theoretical, deductive top-down manner (Braun and Clarke, 2006). The primary purpose of the inductive 'bottom up' approach was to enable research findings to become evident from the themes frequently mentioned and intrinsic in the raw data. By using a 'bottom-up' approach these themes crystallised without structured methodologies imposing constraints on the data (Thomas, 2006).

It was accordingly concluded that data saturation had been achieved for the research. The transparent manner in which data collection and analysis is explained in the dissertation allows the researcher to argue that transparency had been achieved.

4.4.6.2 Analysis of the interview data

Saunders et al. (2009) and Yin (2014) stated that the utilisation of a Computer-assisted Qualitative Data Analysis (CAQDAS) package offered a variety of advantages in the context of analytical techniques for case study research. However, they cautioned that it did not perform the final analysis.

On a more practical level, Saunders et al. (2009) provided a checklist to assist in the selection of a CAQDAS package. Having given due consideration to the perspectives of Rowley (2002), Saunders et al. (2009) and Yin (2014) in this context, the researcher decided to use ATLAS.ti as the CAQDAS package of choice for the research.

The transcribed interviews were coded using ATLAS.ti. The patterns and themes emanating from the ATLAS.ti data analysis (as depicted in Chapter 6) were linked back to the survey questionnaire results as presented in Chapter 5.

4.4.6.3 General analytic strategies

Yin (2014) advised that, prior to commencing with data analysis, careful thought should be given to the analytic strategy that the researcher intended to follow. Four general analytic strategies were accordingly introduced by Yin, namely:

- Dependence on theoretical propositions;
- Dealing with the data from the bottom up;
- Developing the description of a case; and
- Investigating credible competing explanations.

From these four strategies the researcher implemented the 'dependence on theoretical propositions' strategy, working in tandem with the 'dealing with the data from the bottom up' strategy. The 'dependence on theoretical propositions' strategy was adapted to incorporate

the notion of 'practical propositions', e.g. all attributes were not regarded as equally important when measured relative to one another. The reasoning for the adoption of these strategies was as follows.

Yin (2014) stated that the point of departure for the dependence strategy was the theoretical propositions identified for the framework of the research. These propositions should assist in organising the case study analysis. The research aim, the research questions and the design should be founded on the mentioned set of propositions (Yin, 2014).

The researcher developed a framework similar to that described by Yin (2014). This framework reflects the research aim, research questions and propositions (Figure 2.3 in Chapter 2). The framework and the work done (as in Table 4.4) reflecting the connection between the research questions, the interview questions and references to the literature shaped the plan for data collection. The 'dealing with the data from the bottom up' strategy (Yin, 2014) was gainfully used by the researcher for the analysis of the data emanating from the survey questionnaire.

In the context of analytic strategy and techniques, Yin (2014) further advocated that the utilisation of the following five analytic techniques should be considered:

- Pattern matching;
- Explanation building;
- Time-series analysis;
- Logic models; and
- Cross-case synthesis.

These techniques had the particular intent to assist in dealing with the challenges of developing internal and external validity (also referred to as generalisability).

The research, by using multiple cases, explored the important and essential attributes of a sponsor on a megaproject. In this context and after further analysis the cross-case synthesis analytic technique was considered and applied to the research. Each individual case study was treated as a separate study. Conducting the cross-case synthesis as an analysis technique required a strong reliance on argumentative interpretation of the findings (Yin, 2014).

4.5 SUMMARY

The chapter provides a view of the research design and research methodology forming the basis for the research. A multiple-case study approach was used. The dissertation

contributes by identifying the attributes, effective utilisation thereof and the effect on project success (Figure 2.2 in Chapter 2) at the theoretical and contextual level.

Six cases were identified that readily provided access to senior and executive management at the three organisational levels where direct interface between executive management and the sponsor, and the sponsor and the project manager took place. These interfaces were considered most appropriate for the identification of important and essential sponsor attributes required for project success. Twenty-six interviews were conducted with senior project members and accompanied by a survey questionnaire with the same interviewees. A focus group activity completed the process of primary data collection.

The interviews were transcribed and coded and, together with the survey questionnaires, analysed (see Chapters 5 and 6) to enable achievement of the research aim. The findings from the analysis of the survey questionnaire dealing with the data from the bottom up are reflected in Chapter 5. The findings from the analysis of the interviews (transcribed, coded and using the ATLAS.ti CAQDAS package) are presented in Chapter 6.

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CHAPTER 5

EXECUTIVE SPONSOR ATTRIBUTES AND MEGAPROJECT SUCCESS⁴

5.1 INTRODUCTION

This chapter investigates the attributes required by executive sponsors of megaprojects.

The global drive for investment by both governments and the private sector in infrastructure development is continuing unabated. Such investments often resulted in the implementation of megaprojects, i.e., projects with a cost greater than US\$1 billion (Drouin, 2018). The influence of these projects was not only financial; they also had a direct influence on the wellbeing of the society that they were intended to benefit, e.g. the growth of national economies and improvement in the quality of life of individuals (Fischer & Amekudzi, 2011; Flyvbjerg, 2014). The value generated by these investments was therefore extremely important, although the projects were often driven by ambitious and unrealistic goals. Megaprojects were unfortunately failing at a rate that affected national economies and millions of people (Flyvbjerg, 2014; Mellow, 2011), and enhanced attention to management practices was required to ensure the economic growth and societal change intended (Drouin, 2018).

The solution to dealing with failed megaprojects partly resided in management practices that delivered intangible benefits, e.g. social capital enhancement (Bornstein, 2010). Such social capital comfortably provided for the concepts ‘megaproject team’ and ‘executive sponsor’ in the definition.

It has been well documented that sponsors play a very important role on projects in general (Association for Project Management (APM), 2018; Barshop, 2016; Morris, 2013; Project Management Institute (PMI), 2014). The effectiveness of the sponsor being ‘the best single predictor of project success or failure’ (APM, 2018, p. 4) stressed the importance of the sponsor. The view that the personal attributes of sponsors directly influenced their effectiveness was equally well documented (APM, 2018; Barshop, 2016; Crawford, Cooke-Davies, Hobbs, Labuschagne, Remington & Chen, 2008; Helm & Remington, 2005; Morris, 2013; PMI, 2014; Remington, 2011; West, 2010).

⁴ This chapter has been submitted for consideration for publication in the *International Journal of Project Organisation and Management* as Louw, W., Wium, J., Steyn, H., & Gevers, W. Executive sponsor attributes and megaproject success.

Despite the importance of the sponsor, there was minimal guidance available to boards or executive management responsible for the appointment of megaproject sponsors (APM, 2018; PMI, 2014). This chapter investigates the perceptions of a number of executives and senior managers who acted either as an executive manager responsible for the selection of a megaproject sponsor, a megaproject sponsor, or a megaproject manager. To ensure a balanced perspective, both successful and failed megaprojects were included in the study.

The research methodology includes a pilot case study, interviews, questionnaires and a focus group activity. This chapter reports on differences and commonalities in relation to the identification of megaproject sponsor attributes between:

- Public and private sector projects;
- The views of executive management, sponsors and project managers; and
- Successful and failed projects.

5.1.1 Megaprojects

Flyvbjerg (2014) described a megaproject as a 'large-scale, complex venture that typically cost US\$1billion or more, takes many years to develop and build, involves multiple public and private stakeholders, is transformational, and affects millions of people'.

The PMI (2014) stated that executive sponsors were primarily allocated to projects of strategic importance that were complex, carried a certain degree of risk, were very discernible and were allocated very sizeable budgets. It could accordingly be deduced that a megaproject sponsor was from the executive (most senior) ranks of an organisation. For the remainder of the chapter, where the term sponsor is used, it implies an executive sponsor.

Similarly, the term project includes the descriptors project-based programme and megaproject, and the term project manager includes the descriptors project director, programme manager and programme director.

5.1.2 Megaproject failure rate and its implications

Morrow (2011) indicated that 65% of industrial megaprojects failed to meet business objectives in all three the dimensions (cost, schedule and operability), and defined success as 'a lack of failure'. If a project performed worse than the threshold on any of the criteria used by Morrow (2011), it was classified as a failure. If a project did not experience any one of the three dimensions as a problem, it was classified as a success.

Flyvbjerg (2014, 2017) stated that about 10% of megaprojects were completed within budget, about 10% were on schedule, and about 10% delivered the promised business benefits.

The view that a project should not be evaluated only on results at project completion or shortly afterwards was expressed by various authors. The potential that it offered in achieving desired business objectives and generating new business or opportunities in future should also be considered (Pinto, 2004). This view was supported by Kloppenborg, Tesch, Manolis and Heitkamp (2006), the Office of Government Commerce (OGC) (2007), Sewchurran and Barron (2008), Shenhar, Dvir, Levy and Maltz (2002) and Turner and Zolin (2012). To date, the dimension of delivering promised benefits over the longer term (as motivated by the cited authors) has not been visibly incorporated into the measures of success of a megaproject. The ‘iron triangle’ of delivering the promised benefits within budget and on time (Flyvbjerg, 2017, p. 11) still ruled the discourse on project success – megaprojects included. The criteria for the success or failure of megaprojects were accordingly limited in this chapter to the ‘triple constraint’ notion of time, cost and operational performance (promised benefits) as described by Merrow (2011).

5.1.3 Role of the executive sponsor on megaprojects

In defining the terms ‘sponsor’ and ‘sponsorship’ significant work has been done by Crawford et al. (2008) in reviewing four national and organisational standards for project management.

Despite an inconsistency between the four standards mentioned above on how the role of the sponsor was carried out (e.g. by either an individual or a group), the similarities were quite clear, and five key themes emerged. The sponsor was:

- At a senior level in the owner (a.k.a. client or customer) organisation;
- In a role involving substantial dimensions of leadership (as opposed to sponsorship being just a management role);
- Responsible for ensuring that an effective governance framework was created for the project;
- The owner of the business case for the project, and ultimately responsible for the delivery or realisation of the benefits projected within the business case; and
- Positioned structurally on the interface between the owner and project organisations. This positioning enabled decision-making and support for the project manager, particularly for issues beyond his/her control.

Morris (2013, p. 146) stated that the conduct of the sponsor ‘can arguably make him the single most influential “actor” on the project, with a disproportionately high impact on outcome success’.

The APM (2018, pp. vii, 4) took an even broader view of the role of the sponsor: It stated that the role was pivotal to the governance of project management and the broader ongoing

success of organisations. Bourne (2015, p. 125) was of the view that senior stakeholder support (specifically from the sponsor) was key to project success. Barshop (2016) viewed the sponsor as the one person accountable for the value to be delivered by the project and emphasised that this was a leadership role while Turner and Müller (2006) also stated that sponsor engagement was decisive for project success.

The PMI (2012, 2013) emphasised the relationship between project success and active sponsors. Remington (2011) also accentuated the need, particularly within a megaproject context, for the sponsor role to be played on a dedicated basis.

5.1.4 Responsibilities and accountabilities

Where the sponsor or sponsorship was addressed in the project management literature, it was not only comprehensively recognised that the sponsor role was a crucial component of any project, it was also acknowledged that the sponsor made a significant contribution to the success or failure of the project (APM, 2018; Barshop, 2016; Bourne, 2015; Bryde, 2008; Crawford et al., 2008; Morris, 2013; PMI, 2014; Remington, 2011; Turner & Müller, 2006; West, 2010).

In addition to the OGC standards (2007), Crawford et al. (2008), Nicholas and Steyn (2017) and Remington (2011) were quite specific in their reflections on a project sponsor as an individual versus a group, that there was a clear place for groups in the sponsorship role. Bryde (2008), however, stated specifically that the predominant trend in the literature was for the sponsor to be an individual. Additionally, reference to the sponsor as an individual had also been identified in the work of the APM (2018), Barshop (2016), Bourne (2015), Morris (2013), the PMI (2014) and West (2010). The position in this chapter therefore is that for a megaproject, an individual performs the sponsorship role, preferably on a full-time basis.

In order to broaden the understanding of the roles, responsibilities or accountabilities of the project sponsor, the following approach was adopted.

An initial assessment (to test for duplication) was performed on the descriptors of the roles, responsibilities or accountabilities identified and used by the following authors or publications: The APM (2018), Barshop (2016), Crawford et al. (2008), Morris (2013), Nicholas and Steyn (2017), the PMI (2014) and West (2010).

Congruence in the use of the term 'accountability' of the sponsor between the sources above was as follows:

- Owning the (robust) business case of the project, driving the realisation of its intended benefits, and recommending cost/benefit opportunities;

- Providing direction by, among other things, developing a vision for the project, ensuring alignment of the project with company strategy, and building project team commitment to the project;
- Establishing values, and creating a value-based culture and environment that ensures success;
- Managing barriers or problems outside the remit and control of the project manager, to ensure the capture of the intended project value; and
- Giving direction and clarifying the framework for effective governance.

5.1.5 Attributes of the sponsor

While assessing the accountabilities of the sponsor indicated in literature, two themes were consistently identified. Firstly, it was found that the effectiveness of the sponsor was the single best predictor of project success or failure (APM, 2018). Secondly, it was found that the personal attributes of the individual carrying out the role directly influenced his/her effectiveness (APM, 2018; Barshop, 2016; Crawford et al., 2008; Morris, 2013; PMI, 2014; Remington, 2011; West, 2010). The relationship between the attributes of the sponsor, the effectiveness of the sponsor, and project success is depicted in Figure 3.1 in Chapter 3.

In Chapter 3 the researcher developed from literature a list of 32 attributes required by an executive sponsor. An appraisal of these attributes may suggest that a single individual was unable to possess the full spectrum of attributes. Remington (2011) supported the view that all the required attributes were rarely found in one person and added that the right teams could possess all the attributes. Similarly, De Klerk (2014) reflected that the list of recommended leadership characteristics (read attributes) and traits prescribed in the literature were unrealistically comprehensive and optimistic.

5.1.6 Objective of the study

This study investigates the relationship between the personal attributes of the individual appointed as sponsor, as listed in Chapter 3, and how these attributes influence his/her effectiveness. It also explores the relationship between the effectiveness of the sponsor and project success.

This chapter identifies attributes of an executive sponsor that are considered either important or essential for project success. The results were obtained from interviews with and a survey administered to 26 executives involved in six megaprojects. Whilst previous research, referred to above, identified sponsor attributes, these attributes were so wide that it was extremely unlikely that one would find all these attributes in a single person. The contribution of this research is that it identifies project sponsor attributes that are considered important or essential for project success.

5.2 METHODOLOGY

5.2.1 Conceptual framework

The conceptual framework for the empirical research, as depicted in Figure 2.3 in Chapter 2, consists of a number of propositions and research questions derived from previous research as listed in Chapter 3. Answers to the research questions identified important and essential attributes an executive sponsor of a megaproject should possess. The identification of these attributes, and their effective applications, should contribute to a higher probability of success on a megaproject.

5.2.2 Research methodology

As the researcher had no control over the contemporary phenomenon (sponsor with attributes) or the context (megaproject), the case study methodology best met the requirements of the overall study (Merriam, 1998; Stake, 2005; Yin, 2014).

Six recent South African megaprojects were selected for the study. Interviews were held with project participants and half of the questions in the interview guide explored the important and essential attributes of a sponsor of a megaproject from a non-project specific perspective. The other half of the questions solicited the views of the interviewees specifically for projects they were involved in. These included:

- Identification and appointment of the sponsor for the project;
- Level of participation of the sponsor on the project;
- The reaction of the sponsor to unforeseen circumstances; and
- The success or failure of the project measured with criteria as described by Merrow (2011).

In South Africa, the public sector typically delivers infrastructure megaprojects, including those with a profit motive, while the private sector delivers industrial megaprojects. Examples of infrastructure projects are electricity generation projects (coal-fired and pumped-storage power generation), a multi-purpose pipeline and a high-speed commuter rail network. Capital-intensive industrial mega-manufacturing projects are typically delivered by the private sector.

A number of megaprojects from multiple sites were identified for possible selection for the study. An analysis was done of the presence of megaprojects (industrial and infrastructure) with a profit motive, using locally published databases. Eleven projects met the US\$1 billion threshold as defined by Flyvbjerg (2014) and Merrow (2011) for megaprojects. From the 11 projects, six were selected, based on the accessibility to and availability of senior managers, consisting of three private and three public-sector megaprojects, each with a value greater than US\$1 billion at time of sanctioning of funds. All were completed since 2006. The six

cases were within the range of four to 10 case studies required for multiple-case study research (Easton, 2010; Eisenhardt, 1989).

The primary form of data collection for the overall study was semi-structured interviews (supported by a questionnaire), supplemented by a focus group activity.

Semi-structured interviews and a survey (via a questionnaire) were conducted with the participants involved in the leadership and management of the projects, i.e., executive management or board, sponsor and project manager. The same participants who were interviewed completed the questionnaire after the interviews. All the respondents were, by means of the survey, requested to assist in identifying the important and essential attributes that an executive sponsor should possess. The content of the survey questionnaire was not shared with the respondents prior to the interview.

5.2.3 Pilot case study

A pilot case study was used in the research to validate the appropriateness of the survey guide questions, to improve the plans for data collection, and to determine the effective line of questioning (Yin, 2014). These objectives were achieved. Given the relative infrequent occurrence of megaprojects, the project for the pilot case study was selected from the six projects forming the basis for the multiple-case study. The pilot case study consisted of an interview with the pilot case study participants. The same participants who participated in the interviews for the pilot case study also completed the survey questionnaire mentioned above.

All the interviewees reflected that they considered the interview guide questions to be appropriate. However, some interviewees indicated a need for more questions to determine who would make a good sponsor, and how adequately the selected sponsor had been prepared for the role. The interview guide was adjusted accordingly.

5.2.4 Interviews and subsequent questionnaire

The participants were all either executive managers with extensive managerial experience or senior functional managers with extensive technical experience. The only exception was a senior human resources manager with extensive expertise in skills assessment. They all gained megaproject experience either as megaproject manager, sponsor or executive manager responsible for the appointment of the sponsor, on one of the cases investigated. They also had substantial experience of other large projects undertaken in their respective organisations (further descriptions of their work experience are available in Appendix E).

The semi-structured interviews included the identification of attributes (both important and essential) of a sponsor by the interviewees. The interview guide for all three organisational levels (board or executive management, sponsor and project manager) contained pertinent

questions on the ‘what’ and ‘why’ for important and essential attributes. The interview guides for each organisational level also included questions that pertinently addressed other research issues regarding:

- How the potential sponsor is identified;
- Which psychometric and other tests could be used to reliably assess the important attributes of a sponsor; and
- What the level of active participation and continuity of a sponsor ideally should be whilst on a project.

Immediately after completion of the interview, each interviewee was requested to complete a questionnaire that contained all 32 attributes identified in Chapter 3. As background to the questionnaire, each interviewee was reminded that it was very unlikely that a single individual would be able to fulfil the full spectrum of attributes. The practical number of essential attributes a sponsor should reasonably possess appears to be seven (APM, 2009, 2018; Barshop, 2016; Bourne, 2015; De Klerk, 2014; Englund & Bucero, 2006; Helm and Remington, 2005; Pacelli, 2005; PMI, 2014; Valencia, 2007; West, 2010; Zaccaro, Kemp & Bader, 2004). The respondents were also invited to add any other attribute not listed in the survey questionnaire.

5.2.5 Focus group activity

A focus group activity was conducted to determine, firstly, whether the attributes of sponsors differed between industry sectors. Secondly, the focus group was used to determine whether the attribute profile of a sponsor differed between megaprojects and other relatively large projects. The focus group activity was held with eight out of a possible 13 key players representing three of the case study projects. These three projects were undertaken by one organisation and were in the petrochemical, chemical and mining sectors.

5.3 PROJECT DESCRIPTIONS

The six case studies

The projects selected for the study were from both the private and public sectors. The industry sectors that were represented in the selection were mining and minerals (coal), energy (pumped-storage electrical power generation), fuels and chemicals (i.e., wax from natural gas) and transport (rail and pipeline).

From information available in the public domain about cost, schedule and operability, and from the interviews, it was found that the failure rate for these megaprojects was reasonably

similar to that reported globally for megaprojects, i.e., 65% (Morrow, 2011). Four of the six projects selected did not meet the criteria for success as described by Morrow (2011).

The six projects forming the basis for the individual case studies are presented in Table 4.3 in Chapter 4.

Further details of the projects are provided via a description of the purpose, specifics of the sponsor and the measures used for the determination of the success or failure of the project in Appendix D.

An elaboration of the qualifications of the participants fulfilling the roles of the sponsor, executive management and project manager on the projects is provided below.

5.4 FINDINGS

5.4.1 Qualifications of participants

The data on the qualifications of the 26 participants who participated in both the interviews and surveys (executive managers, sponsors and projects managers) reflected the following:

- Mainly because of retirements, resignations or organisational changes, certain projects had more than one sponsor and all nine of the sponsors were engineering graduates;
- Six of the sponsors had a further qualification in business studies (MBA or similar) or in commerce;
- All the sponsors had significant experience of their businesses and held executive positions. Seniority and positional power were accordingly considered attributes possessed by the sponsor;
- Of the 11 participants interviewed at the executive management level, only three were not engineering graduates. Seven executive managers had a further business (MBA) or commerce qualification;
- The six project managers were all technically qualified but not all were engineering graduates. Three of the project managers held engineering degrees and three had a further business (MBA) or commerce or project management degree;
- The senior managers responsible for psychometrics and skills assessment and the project management office (PMO) within the national electricity utility held a master's degree in industrial psychology and a national diploma in electrical engineering respectively. The senior manager responsible for the PMO was also the holder of an MBA degree; and
- Of the 26 participants, 21 were engineering graduates and 15 held a further degree in business administration, business leadership or commerce.

5.4.2 Pilot case study

It was recognised that the responses during the interviews with the five participants involved in the pilot case study (two group executive members, two sponsors - with a change in this role necessitated by organisational changes - and the project director) would not allow exhaustive deductions to be made. An analysis of the responses obtained during the pilot case study interviews, however, indicated that the following attributes were not only considered important but also essential for megaproject success:

- Appropriate seniority, credibility and power (both positional and personal) in the organisation;
- Ability and willingness to bring objectivity to the project team, and to challenge project assumptions; and
- Good negotiation skills, particularly in the context of securing resources for the project manager, as well as conflict resolution and achieving compromises.

The above-identified essential attributes are part of the list of top essential attributes as explained later in this section.

5.4.3 Interviews and subsequent questionnaire

The data obtained from the survey questionnaire was used to rank the 32 attributes identified in Chapter 3 and to graphically portray:

- The cumulative voting for essential votes per attribute as in Figure 5.1; and
- The combined results of important and essential votes per attribute as in Figure 5.2.

The essential votes per attribute [for the total number of survey participants (N=26) in a stacked numbers format and sorted from left to right] are reflected in Figure 5.1.

The important plus essential votes per attribute for N=26 are graphically presented in stacked numbers format and sorted from left to right and large to small in Figure 5.2. The reason for portraying both figures is to bring an element of triangulation to the study. It is also to ensure that sufficient consideration is given to the testing of significant differences between the two data sets.

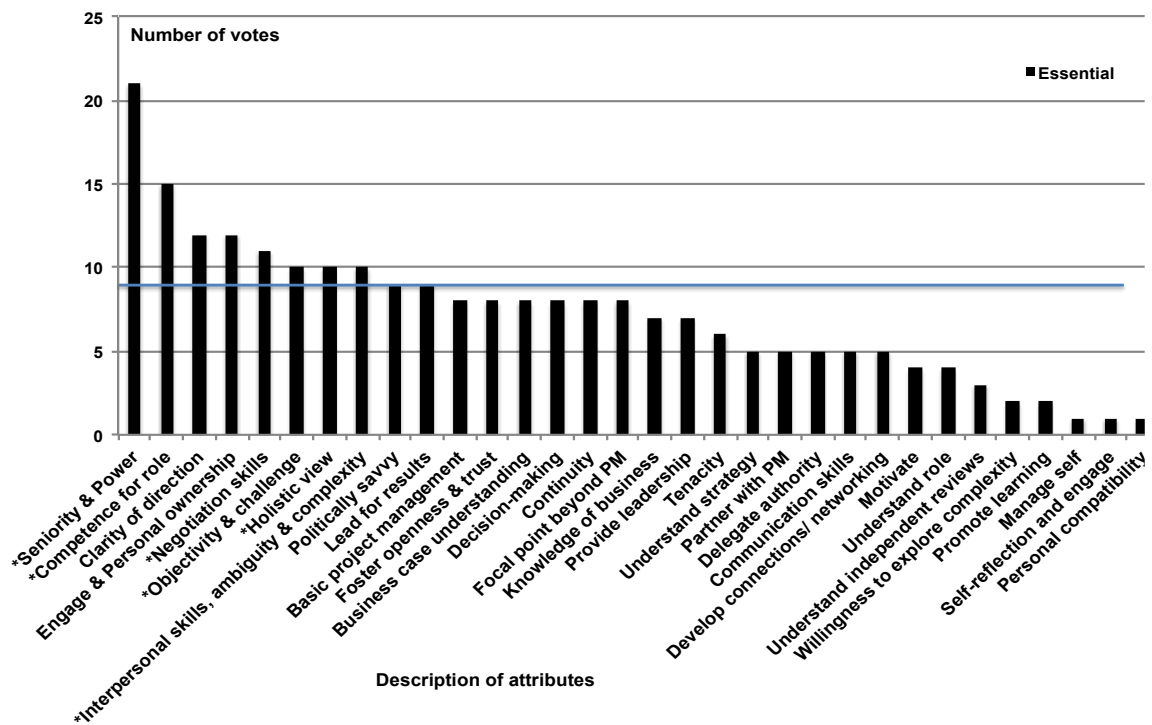


Figure 5.1: Essential votes per attribute for total survey respondents (N=26)

* Attributes also found in the top eight for Figure 5.2

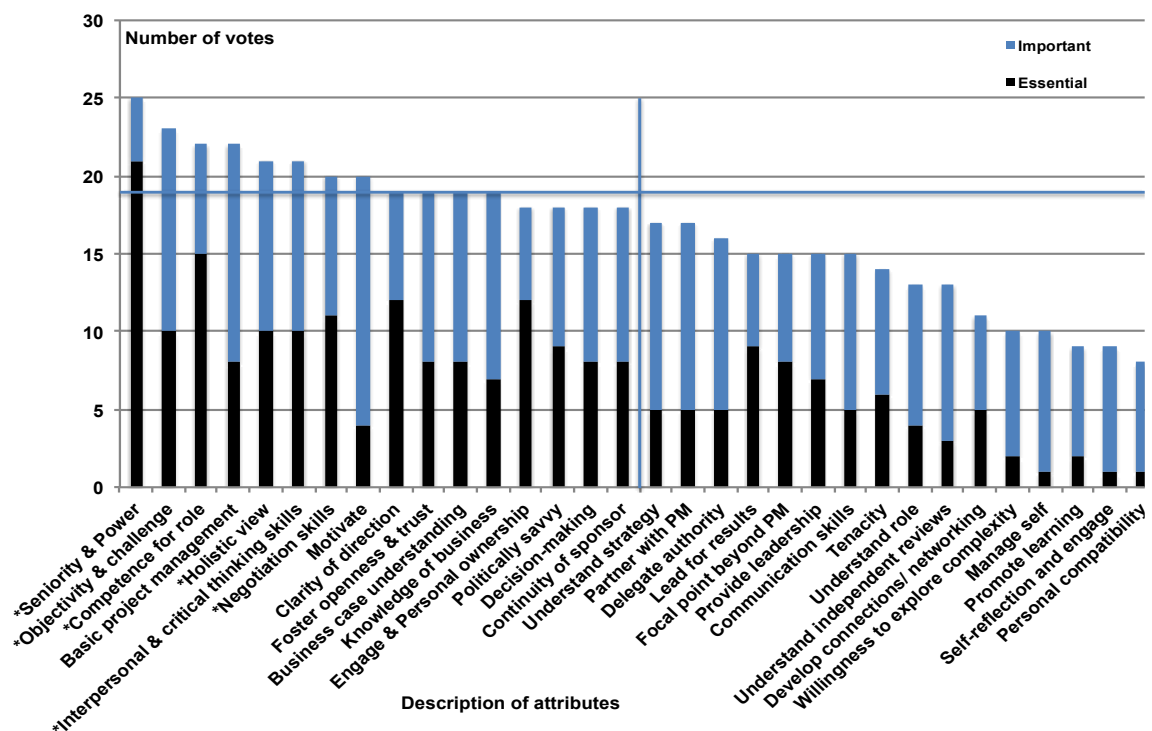


Figure 5.2: Important plus essential votes per attribute for total survey respondents (N=26)

* Attributes also found in the top eight for Figure 5.1

As contextualised earlier in the chapter, the practical number of essential attributes of a sponsor appeared to be seven (within a range of five to 10). With this guidance, and evaluating Figures 5.1 and 5.2, it appeared that eight was a realistic number of essential attributes to select. In both datasets there was a drop off in votes after the first eight attributes (reading the attribute votes from left to right on the horizontal axis) making eight attributes a practical limit (the next drop off is after more than 10 attributes which makes it impractical). For the purpose of the study the attributes encapsulated are referred to as the top-eight essential attributes that a sponsor should possess from a survey questionnaire perspective.

Similarly, a point on the horizontal axis of both Figures 5.1 and 5.2 (reading from left to right) is identified where an increased rate of reduction of the number of votes per attribute becomes clearly visible. For both figures, this point is reached after 16 attributes, as is indicated by the vertical line in the figures. Beyond this point, the remaining attributes are considered neither essential nor important.

The attributes found in the top-eight list of both Figures 5.1 and 5.2, are indicated by an asterisk (*) in the figures. The top-eight combined scenario is reflected in Figure 5.3. The votes per attribute for N=26 are diagrammatically presented in stacked numbers format and sorted for essential votes from left to right and large to small in Figure 5.3.

Both the 'clarity of direction' and 'engagement and personal ownership' attributes garnered more essential votes than the 'knowledge of basic project management' and 'ability to motivate' attributes. The cumulative total (important and essential) votes for the latter two attributes are more than for the first two attributes mentioned. By arguing that essential votes carry a greater weight than important votes when the total votes per attribute are relatively close, it is concluded that the 'clarity of direction' and 'engagement and personal ownership' attributes are essential top-eight attributes. The 'knowledge of basic project management' and 'ability to motivate' attributes then become part of the important but not essential attributes spectrum.

The final top-eight essential attributes required for success by an executive sponsor on a megaproject from a survey questionnaire perspective are accordingly listed as follows:

1. Appropriate seniority, credibility and (personal and positional) power within the organisation. Credibility is understood in terms of being accepted by the organisation and stakeholders as suitable for the role*;

‘You cannot have all the responsibilities in the world with no authority. And if you don’t get those two things right then I say, especially in the public sector, what authority do I have?’ (executive sponsor)

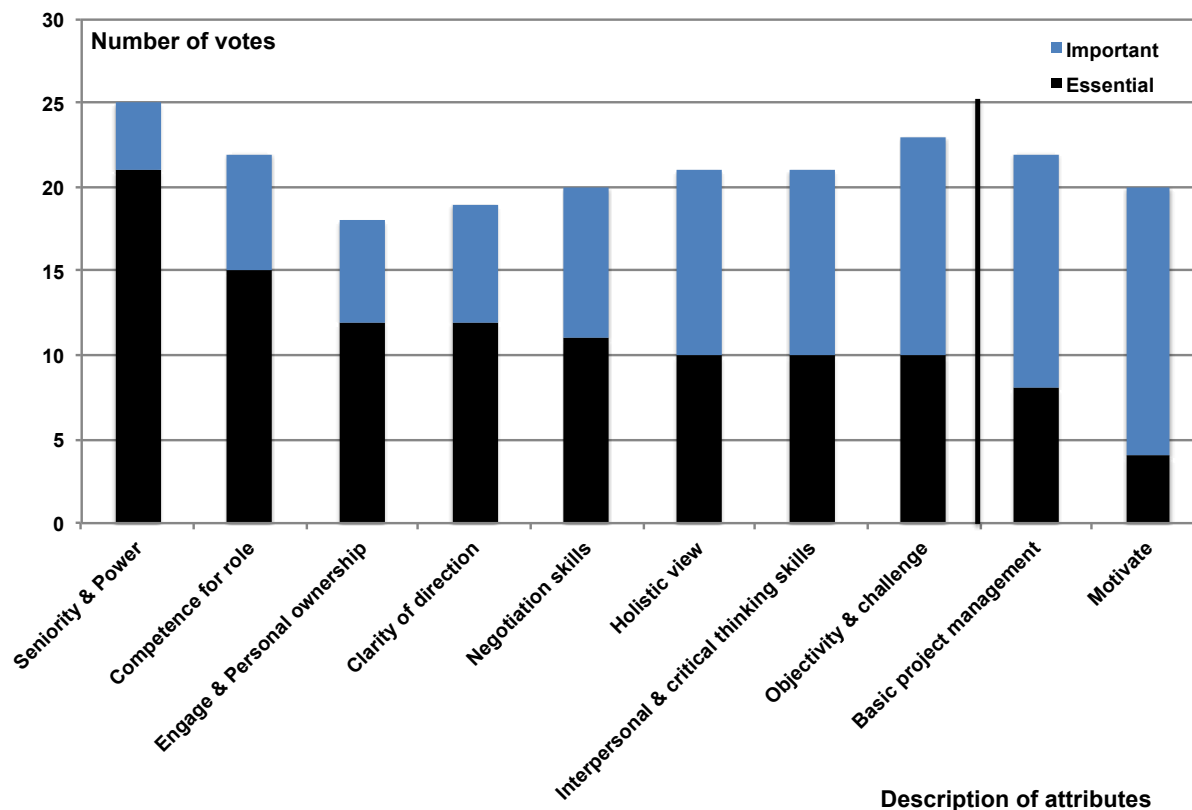


Figure 5.3: Top-eight attributes identified after comparing essential and essential plus important votes

2. Possesses the competence (i.e., the combination of knowledge, personal attitude and skills) to fulfil the role*;

In reflecting on his own sponsor in the case study, a respondent stated that he

‘...understood the broad aspects of the project, technically, financially, legally and also the socio-economic development aspects, including things like local content...’ (project manager)

3. Ability to engage by being willing to take personal ownership and acting in the long-term interest of the organisation (demonstrating loyalty, motivation and commitment);
 ‘Leadership capability. And then also very important I think is “commitment” to the project. The sponsor actually needs to “believe” that the project should be done.’ (executive manager)
4. Ability to provide clarity of direction (including the development of a compelling vision) within the context of the strategy and governance arrangements of the organisation;

‘In my mind he should be able to drive strategy. For that matter, he must, being a strategist, also understand the business that he is in and what are the real critical success factors.’ (project manager)

5. Possesses good negotiation skills, particularly in the context of securing the availability of resources (financial, people or other) for the project manager*;
6. Ability to take a holistic view and engage peers in the organisation for advice and support for key decisions*;

‘I think the big one for me is you [the sponsor] need a “big picture attitude”...’ (executive sponsor)

7. Possesses interpersonal and critical thinking skills, including the ability to work with and handle ambiguity*; and
8. Ability and willingness to provide objectivity to the project team and challenge the project assumptions*.

‘I’ve always been challenging the guys and ask them: “Are there better ways of doing things? Have we really thought of everything?”’ (executive sponsor)

* Sponsor attributes common to ‘top-eight’ lists of both Figures 5.1 and 5.2.

5.4.4 Focus group activity

As mentioned earlier in the chapter, the focus group activity aimed to determine whether the attributes of sponsors differed between industry sectors and whether the attributes profile of a sponsor differed between megaprojects and other relatively large projects.

The outcome of the activity was as follows:

- The group agreed that the attributes of the sponsor did not differ significantly between industry sectors, except that specific knowledge of an industry sector was an essential attribute of an effective sponsor. Even within a specific sector, e.g. mining, an individual with knowledge of gold mining would not necessarily be an effective sponsor of a coal-mining project. The ability to provide guidance during the concept phase and the development of alternatives to arrive at the optimum business case was specifically emphasised in this regard; and
- The group also agreed that the sponsor attributes profile required for megaprojects versus that of other relatively large projects did not differ significantly, except for the specific knowledge of an industry sector as raised above. It was also agreed that, whilst an individual may be able to fulfil the role of sponsor on more than one large project, the complicated nature of a megaproject required a dedicated, single individual for each megaproject.

5.4.5 Analysis of results

From the data provided it was evident that the group of participants was technically well-schooled (engineering degrees) and educated in business management. The nature of the essential attributes identified by the group reflected a balance between the 'harder' (often more intrapersonal) components of the management sciences (attributes #1, 2, 4 and 7) and the 'softer' (often more interpersonal) components of the humanities (attributes #3, 5, 6 and 8). It is very likely that the business management qualifications, with the appropriate focus on the humanities, played a role in this regard. The abundance of engineering degrees of the participants seemed to indicate that an engineering sciences background was an important attribute of sponsors of the type of megaprojects investigated.

If the balance between the management sciences and the humanities for the essential attributes is accepted, it raises the question to what extent the sponsors of the case study projects already possessed this balance in attributes. The megaprojects studied did not perform better than the global success rate of 35%. The evaluation of the case study projects indicates that only two projects (the Gautrain rapid-rail link project and the Collieries replacement/ expansion programme) can be regarded as successes, i.e., a success rate of 33%. It is then possible to suggest that the sponsors for the other four projects studied were lacking the required essential attributes.

5.4.6 Public versus private sector projects

The distribution of the top-eight votes from the respondents on the private sector (N=15) and public sector (N=11) projects is indicated in Figure 5.4. The private-sector top-eight sponsor attributes are indicated with the use of (a) and the public-sector attributes with (b) along the horizontal axis. The black lines in Figure 5.4 connect the essential votes (as a percentage of the total votes) per attribute in the private sector (a's) and in the public sector (b's) respectively.

It is clear from Figure 5.4 that for the public sector the ability of the sponsor 'to be objective and to challenge the project team' was perceived as essential by markedly fewer respondents than for the private sector. A possible explanation for this could be that in the public sector, the sponsorship role can be found to be a relatively weak construct in the creation of the project team (Remington, 2011). Remington further argued that leadership roles in the public sector were to some extent considered as a collective whole across organisational levels, e.g. executive, senior and middle management. How sponsorship manifested within these levels depended very much on the context of the project.

In turn, the ability to provide clarity of direction, take a holistic view, negotiate and be in possession of interpersonal skills were considered to weigh much more for a sponsor in the

public sector than for a sponsor in the private sector. These four attributes plus the attribute 'competence for the role' formed a nucleus of attributes required for a public-sector sponsor. This nucleus was considered essential by 50 to 60% of the public-sector respondents and was very similar in ranking.

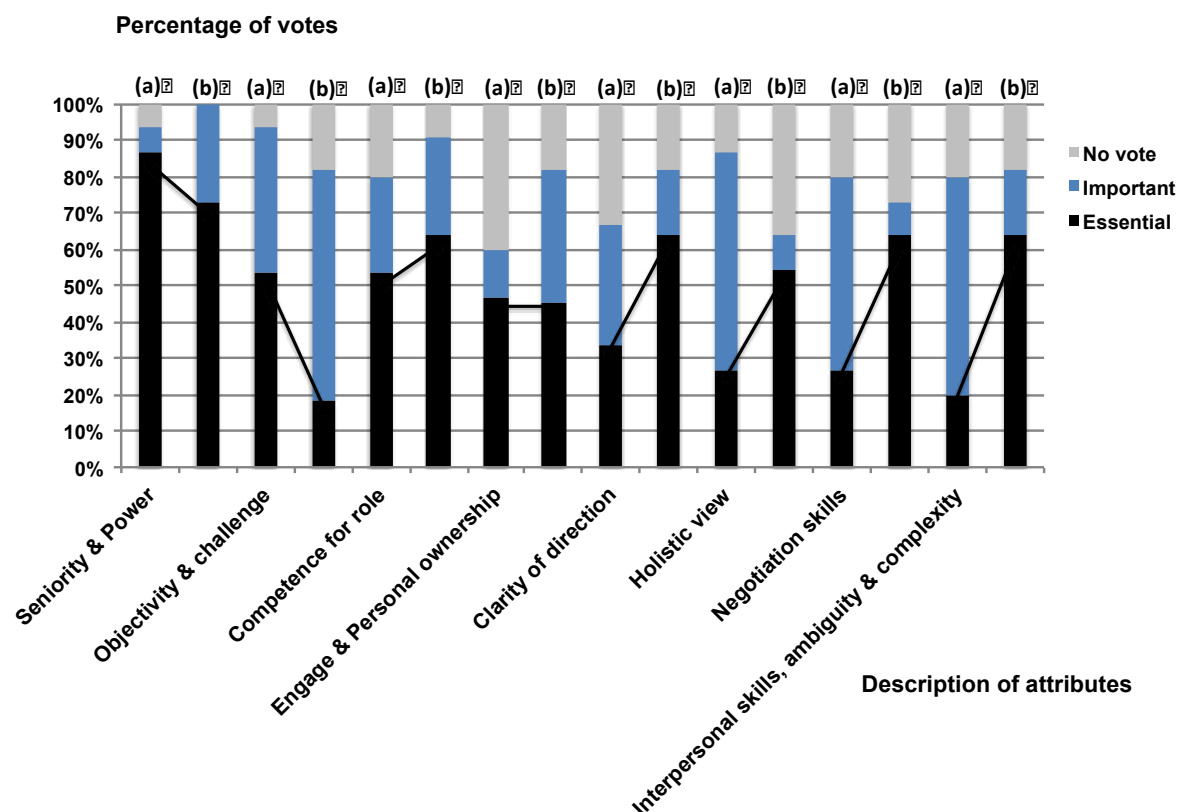


Figure 5.4: Top-eight attributes as voted on private (N=15) and public-sector (N=11) projects

Format: Stacked 100%; (a) = private sector and (b) = public sector;

Sorted for essential attributes, left to right

5.4.7 Executive management versus sponsors versus project management

The voting for the top-eight attributes by executive management, sponsors and project management is represented in Figure 5.5. For the purpose of this analysis the input by the two supporting services participants (senior managers responsible for psychometrics and skills assessment and the project management office respectively in the national electricity utility) were considered part of executive management.

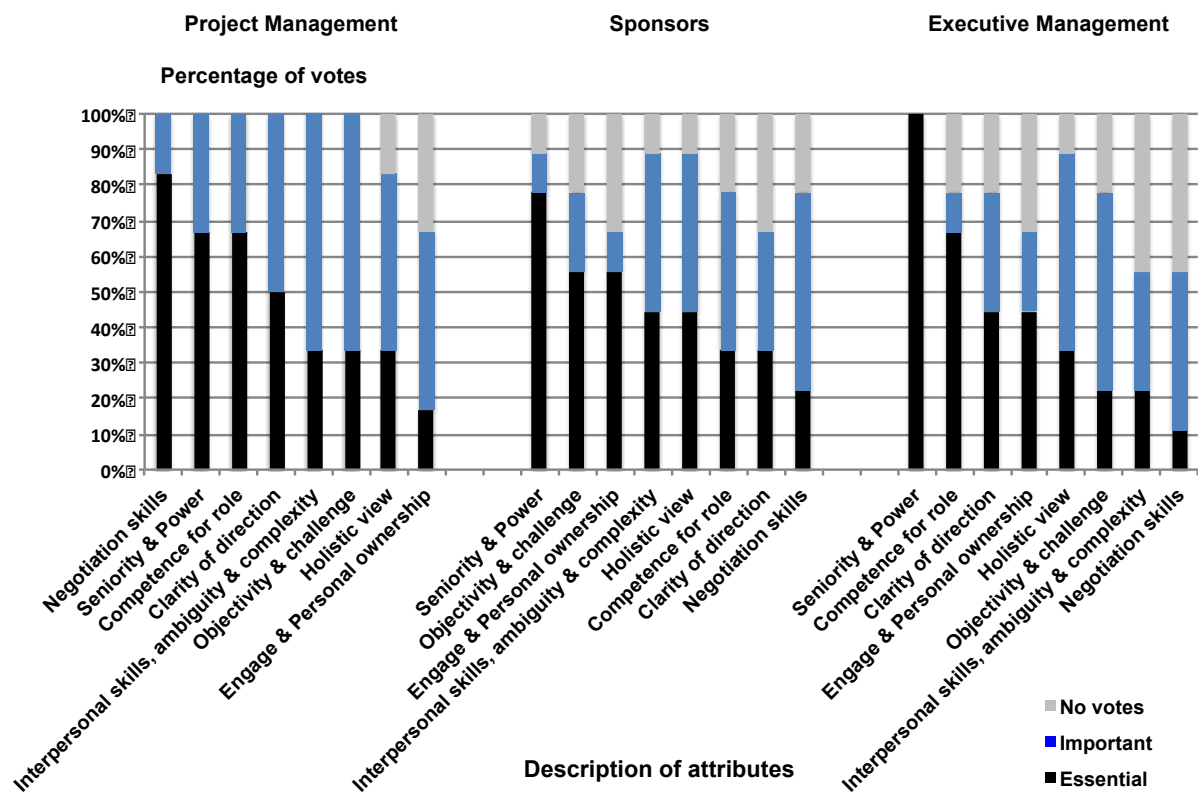


Figure 5.5: Top-eight attributes as voted by project management (N=6), sponsors (N=9) and executive management (N=11)

Format: Stacked 100%; Sorted by essential attributes, left to right

Through inspection of Figure 5.5, the following was deduced (accompanied in certain aspects by possible reasons for the deductions without being too speculative):

- All three organisational levels rated 'seniority and power' as either the first or second essential attribute of the sponsor;
- Whereas project management regarded the 'ability to negotiate' attribute as the first essential attribute, fewer respondents from executive management and sponsor levels considered this attribute as essential. This attribute was particularly valuable to project management in situations where stalemates had been arrived at in contractual discussions and next-level input was required;
- Executive managers, project managers and sponsors viewed 'competence for the role' very differently. Interviewees from both executive management and project management levels regarded this attribute as much more necessary than sponsors did. A possible reason for this was that the sponsors felt that they were competent, hence the 'competency' attribute was taken as a given and rated lower;

- The sponsors considered the ‘ability to be objective and to challenge the project team’ much more important than did either executive managers or project managers. It was possible that one of the specific accountabilities of the sponsor, i.e., providing direction by ensuring alignment of the project with company strategy, played a distinct role in this assessment from a continuous validation perspective;
- Project managers considered the sponsor ‘being engaged and taking ownership’ as the least significant of the essential attributes. This clearly differed from the perspectives of executive managers and sponsors. Project managers were often wary of others interfering in their projects and this might be an explanation for this assessment; and
- Executive managers, project managers and sponsors all considered the ‘ability to take a holistic view’ as of a lesser essential ranking. However, in particular for the sponsors and executive managers this was misleading. When total votes (including for important attributes) were considered, the attribute ‘ability to take a holistic view’ featured significantly stronger.

5.4.8 Successful versus failed projects

The difference in voting for the top-eight attributes by executive managers, sponsors and project managers as per the combined results of the successful projects compared to the combined results of the failed projects is represented in Figure 5.6. In Section 5.4 the successful projects (when measured with the criteria as per Merrow (2011)) were indicated as the Gautrain rapid-rail link project and the Collieries replacement/ expansion programme. The other four projects were considered failed projects (see Table 4.3 in Chapter 4). The information in Figure 5.6 was obtained from nine respondents from the successful projects and 17 from the failed projects.

For this analysis, the input by the two senior managers from supporting services responsible for psychometrics and skills assessment and the project management office respectively in the national electricity utility were included.

From Figure 5.6 it was deduced that:

- The respondents on both the successful and the failed projects rated ‘seniority and power’ as the most essential attribute;
- The respondents on successful projects considered ‘clarity of direction’ and ‘interpersonal skills, including the ability to deal with ambiguity and complexity’ significantly more important than the respondents on the failed projects;
- The ‘competence for the role’ attribute was considered considerably less important for the respondents on successful projects than for the respondents on failed projects; and

- In the introduction to this chapter, the sponsor's ownership of the business case is emphasised. The expectation was thus that the 'ability to engage by being willing to take personal ownership and acting in the long-term interest of the organisation' would be considered more important for the respondents on successful projects. That was, however, not the case. The respondents on the successful and failed projects indicated no significant difference for the importance of this attribute.

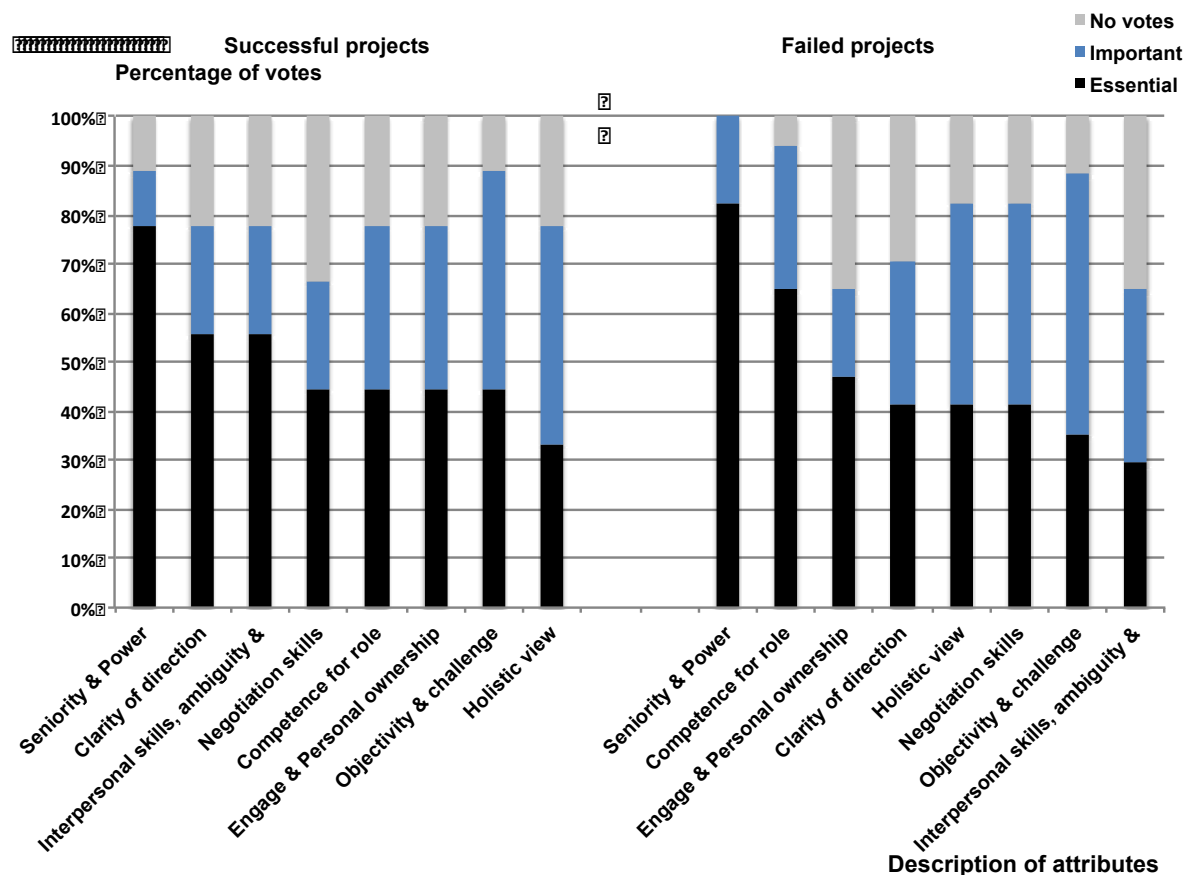


Figure 5.6: Top-eight attributes as voted on successful and failed projects

Format: Stacked 100%; Sorted by essential attributes, left to right and large to small

5.5 DISCUSSION: RESEARCH QUESTIONS AND AIM

The research aim is to identify the important and essential attributes of a sponsor on a megaproject. To achieve this aim it was necessary to answer a number of research questions. The responses from the respondents after consolidation of the results from the survey questionnaire to the research questions are reflected upon as follows.

5.5.1 Research question 1: How is the potential megaproject sponsor identified and appointed and what are the attributes that he/she should possess?

No formal assessment process was used to identify or select any of the sponsors. The sponsors of all six projects were from the executive management ranks of their organisations. The sponsor was either the originator or the developer or the owner of the business case in all six cases. In none of the six cases were the required attributes to perform the role formally considered for their appointment. It was thus not possible to successfully determine the 'how' part of the research question. The attributes a sponsor should possess became clearer as the results of the survey were analysed. The results provided insight into the required sponsor attributes.

5.5.2 Research question 2: How do professionals in the field rank the relative importance of the attributes of megaproject sponsors (assuming not all the attributes are equally important)?

The extensive managerial experience of the respondents participating in the interviews enabled them to rank the relative importance of the attributes with ease. They primarily made use of their prior experience to differentiate between important and essential attributes of a sponsor. By plotting the individual responses received from the survey, relative ranking of the attributes was determined for both important and essential attributes.

5.5.3 Research question 3: Why are certain attributes of the sponsor on a megaproject defined as important?

As indicated in Section 1.6.4, important is defined as 'having serious meaning or worth: Deserving or requiring serious attention' (Merriam-Webster, n.d.). Based on the understanding that not all of a significant number of attributes identified in literature could normally be accommodated in the persona of one individual, it was necessary to identify those attributes that required serious attention. It was thus firstly required to identify the important attributes of the sponsor. The challenge was to create an understanding for the respondents that some attributes were more important than the others in the literature listing. When the respondents were requested to indicate in the survey questionnaire which attributes they considered as important, they were comfortable that the definition provided the necessary assistance. At the end of the interview it was also explained to the respondents that the process of identifying essential sponsor attributes with the survey questionnaire commenced with their identification of those attributes that they considered important for the sponsor to possess.

5.5.4 Research question 4: Which important attributes of a sponsor on a megaproject are considered as essential for the project to be a success?

Figures 5.1 and 5.2 assisted in answering the research question why certain attributes were defined as important, and which important attributes were considered essential. Earlier clarification on the interpretation of Figures 5.1 and 5.2 assisted in identifying those attributes that were considered important. Additionally, both figures then assisted in clarifying the even more important, i.e., essential attributes.

Attempting to identify a large number of essential sponsor attributes was not practical. Only a limited number of attributes should be required to be effective in the role (APM, 2018). As indicated in Table 4.6, it can be deduced from literature that there was a range of five to 10 attributes that a 'normal' individual could possess and the average of seven appeared to be a practical number.

For the purpose of the chapter, the 'top-eight' attributes were considered essential.

5.5.5 Research question 5: Which psychometric and other tests can reliably assess important attributes of a potential megaproject sponsor?

In none of the interviews was it found that psychometric or other tests were used to assess the attributes of a potential sponsor. Chapter 3 suggests a framework for the application of certain psychometric and other tests to determine:

- The leadership style of the potential sponsor; and
- The important attributes of a candidate for the role.

5.5.6 Research question 6: What should the level of active participation of a megaproject sponsor ideally be in order to make a decisive impact on the success of the project?

In none of the cases was it found that the sponsor encroached on the role and responsibilities of the project manager. According to the project managers, active and positive participation of sponsors was considered to be:

- A focus on governance;
- Consistently ensuring that the project supported the business case; and
- Stakeholder management.

Active participation in stakeholder management was emphasised by project managers, especially the 'ability to negotiate' attribute. The project managers found that for matters outside their control that required negotiation, a sponsor with this attribute was particularly valuable. Executive managers considered 'active participation' as knowing what was happening on the project through frequent contact with the project team, often shortly before reporting to a steering committee or board.

'Continuity' was important but it was not considered essential. It should be kept in mind that a megaproject typically has a total lifecycle in excess of 10 years. For an individual with high potential and in the early stages of his/her executive management career, such a period was inordinately long to spend in one position. An older executive, heading towards retirement, might not be a sustainable incumbent for the full project lifecycle. It might be wise for one individual to act as sponsor for the front-end and another for the execution phase of the project.

5.6 CONCLUSION AND RECOMMENDATIONS

As far as could be ascertained, the relationships between the attributes of megaproject sponsors, their effectiveness and project success (Figure 3.1 in Chapter 3) have not been investigated before. This implies a shortcoming in guidance for executives responsible for the identification and appointment of sponsors.

By identifying and ranking attributes required by executive sponsors of megaprojects, this chapter contributes to the sparse literature on this topic and furthermore provides guidelines for executives and company boards who appoint sponsors on megaprojects. The use of the guidelines provided could increase the likelihood of project success.

In all six cases studied, executive management did not formally take attributes into consideration when identifying potential sponsors or in selecting and appointing a sponsor.

Appointing an individual that possessed most of the essential attributes, and ensuring that these attributes were effectively applied, should positively influence the desired successful outcome of a project.

Bourne (2015, p. 125) made a very relevant comment on the governance process of sponsor identification and appointment by stating: '...the era of the "accidental project manager" has largely passed, but we are still in the age of the "accidental sponsor"'. For all the cases studied, the sponsor's identification and appointment was not 'accidental', but the formalisation thereof in terms of attribute assessment should be significantly improved.

From the interviews it was identified that a sponsor in the public sector needed to be very politically astute. During the interviews the sponsors on both the Gautrain rapid-rail link and the new multi-product pipeline projects emphasised the need for political connectedness. For sponsors in the private sector, the need to be connected in an organisational context was considered a vital component of the 'seniority and power' attribute.

Recommendations for future studies include the following:

- The impact of behaviours such as corruption, nepotism, fraud and bribery on the outcomes of projects, and how the sponsor should use his/her attributes in dealing with such behaviours. These behaviours are difficult but not impossible to control;
- An in-depth investigation into the use of psychometric or other tests to determine which of the essential attributes a candidate sponsor possesses;
- Formal consideration and evaluation by executive management of the attributes profile of the sponsor in the selection and appointment process; and
- A potentially onerous yet value-adding task to correlate project success with sponsor attributes.

Implementing an approach where the attributes of a potential megaproject sponsor are assessed is neither revolutionary nor is it a very difficult or costly process. It is also no 'silver bullet' solution to a very complicated problem – the failure of megaprojects. It does, however, have the potential to result in a very significant return on investment.

5.7 ACKNOWLEDGEMENT OF PUBLICATION

This chapter has been submitted for consideration for publication in the *International Journal of Project Organisation and Management* as Louw, W., Wium, J., Steyn, H., & Gevers, W. Executive sponsor attributes and megaproject success.

Contributions of co-authors: The candidate performed the literature review, fieldwork (interviews, surveys) and analysis as required for the paper. He drafted the complete paper that was then critically reviewed by the other authors, just as a PhD supervisor would do.

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CHAPTER 6

COMPUTER-ASSISTED QUALITATIVE DATA ANALYSIS AND RESULTANT COMPARISONS

6.1 INTRODUCTION

This chapter provides an analysis of the semi-structured interviews conducted for the research. Subsequent to the analysis, the results that emanated from the semi-structured interviews are discussed. A comparison between the results from the interviews and the results from the survey questionnaire analysis (described in Chapter 5) is then provided. The resultant output of a process that merges the results of the survey questionnaire and the interview analyses is in turn compared with literature on sponsor attribute identification and selection.

The chapter expands on the deductive approach to the design of the research as referred to in Chapter 4. In doing so, context is provided for the decision to use qualitative content analysis as the preferred method to analyse the data that emanated from the semi-structured interviews. Additional clarification is provided on linking the approach in analysing the semi-structured interview data to the achievement of the research aim, i.e., to identify the important and essential attributes of a sponsor on a megaproject.

To enable the analysis of the semi-structured interviews, use was made of Computer-assisted Qualitative Data Analysis (CAQDAS). CAQDAS is a term introduced by Fielding and Lee (1991) that referred to the wide range of software available that supported a number of analytic styles in qualitative research. The reasoning for the decision to use ATLAS.ti as the CAQDAS package of choice for the research was provided in Chapter 4.

Following a description of the qualitative content analysis methodology in this chapter, the data analysis using the ATLAS.ti application is described, and the results from the application provided. Included in the results are comparisons between the responses by participants involved in:

- Public and private sector projects;
- The organisational roles of executive management, sponsors and project managers; and
- Successful and failed projects.

Next, the results from the survey questionnaire data analysis are compared with the results from the data analysis on the semi-structured interviews. The combined outcome of this comparison in terms of the important and essential attributes that a sponsor should possess

is provided. A perspective is also provided on the responses to those questions in the interview guides that were not specifically related to the differentiation between important and essential attributes.

To provide additional context for the discussion and findings in this chapter, further information on data triangulation is provided (in addition to what was indicated in Chapter 4).

A comparison of the combined outcome as referred to above with a publication by the Association for Project Management (APM), that probably contains the most comprehensive guidance on the identification of sponsor attributes, is provided. The APM (2018) clearly stated that the purpose of the document was to assist sponsors on projects of all sizes. In addition, the revision to the document (from a 2009 edition to a 2018 edition) was pertinently influenced by observations by the National Audit Office in the United Kingdom of the failure of some large projects and the need to strengthen project governance, and ownership in particular. The definition of large projects was not provided in the APM (2018). However, considering the types of projects described by the APM in related literature, there is alignment between large projects and megaprojects defined in this research (Davies, 2019).

This comparison with literature is considered a third data analysis methodology in addition to the survey questionnaire data analysis and semi-structured data analysis methodologies.

This chapter concludes with a summary of the pertinent issues identified and views on convergence, inconsistency and reliability that resulted from the use of three different data analysis methodologies.

6.2 DATA ANALYSIS METHOD

As explained in Chapter 4, the philosophical basis for the research is a realism-based positivist ontological belief (i.e., post-positivism) that results after migrating from an interpretivist post-modern 'becoming' to a realist 'being' ontological belief. This migration within the ontological context (from front-end to execution phase of a project) occurred within an interpretivist (social constructivist) epistemological paradigm (Morris, 2013). In addition, Mayring (2014) stated that the post-positivism or critical rationalism position was a refinement of the positivism position as advocated by Karl Popper (1902-1994). Popper's argument was that it was only possible to achieve an approximation of reality and that it needed to be accompanied by critical efforts (by researchers) to falsify hypotheses for research results to carry some sense of objectivity.

As indicated in Section 6.1, the qualitative content analysis method was selected to analyse the data that emanated from the semi-structured interviews. Mayring (2014) defined 'content

analysis' as a methodical way of allocating categories to parts of text. The application of content analysis was typically found in the analysis of written, verbal or visual communication messages (Elo & Kyngäs, 2008). Content analysis was furthermore a method to make deductions from data that could be reproduced and be valid within a specific context. In doing this, knowledge, new insights and a reflection of facts can be produced.

Alternative text analysis procedures found in the social sciences can be depicted as in Figure 6.1. The primary reasons, based on Figure 6.1, for selecting qualitative content analysis for the research were:

- The direct relationship between the language (the transcribed interviews, i.e., written) and the need to analyse the content of the transcribed interviews for references to attributes; and
- The method of analysis in qualitative research for the 'language' route being qualitative content analysis.

Additionally, it should be noted that the core facets of content analysis were categories (Mayring, 2014). For the research the categories identified from the literature were the attributes (of the megaproject sponsor). Additional categories used were the labels allocated to important and essential attributes. Categories were the tools utilised by the analyst for working through the text, and could be developed inductively or deductively.

This implied that the researcher (for this research, the analyst) was required to work through the texts (transcribed interviews) with a deductively formulated category system (specifically, different attributes identified from literature) and register the occurrence of the categories in the content of the transcriptions (Mayring, 2014).

The difference between deductive and inductive category system formulation was that the categories in a deductive formulation were formulated in advance and did not change during the text analysis. Elo and Kyngäs (2008) and Elo, Kääriäinen, Kanste, Pölkki, Utriainen and Kyngäs (2014) stated that with inductive content analysis the categories were derived from the data. When the structure of analysis was formatted on the basis of previous knowledge (say, from literature) and the purpose of the study was theory testing, deductive content analysis was used.

The outcomes for both formulations were the same: A list of categories (related to text passages) was produced that was typically converted to the frequencies or magnitude of their occurrences.

The approach adopted for the qualitative content analysis process (as guided by Mayring, 2014) follows.

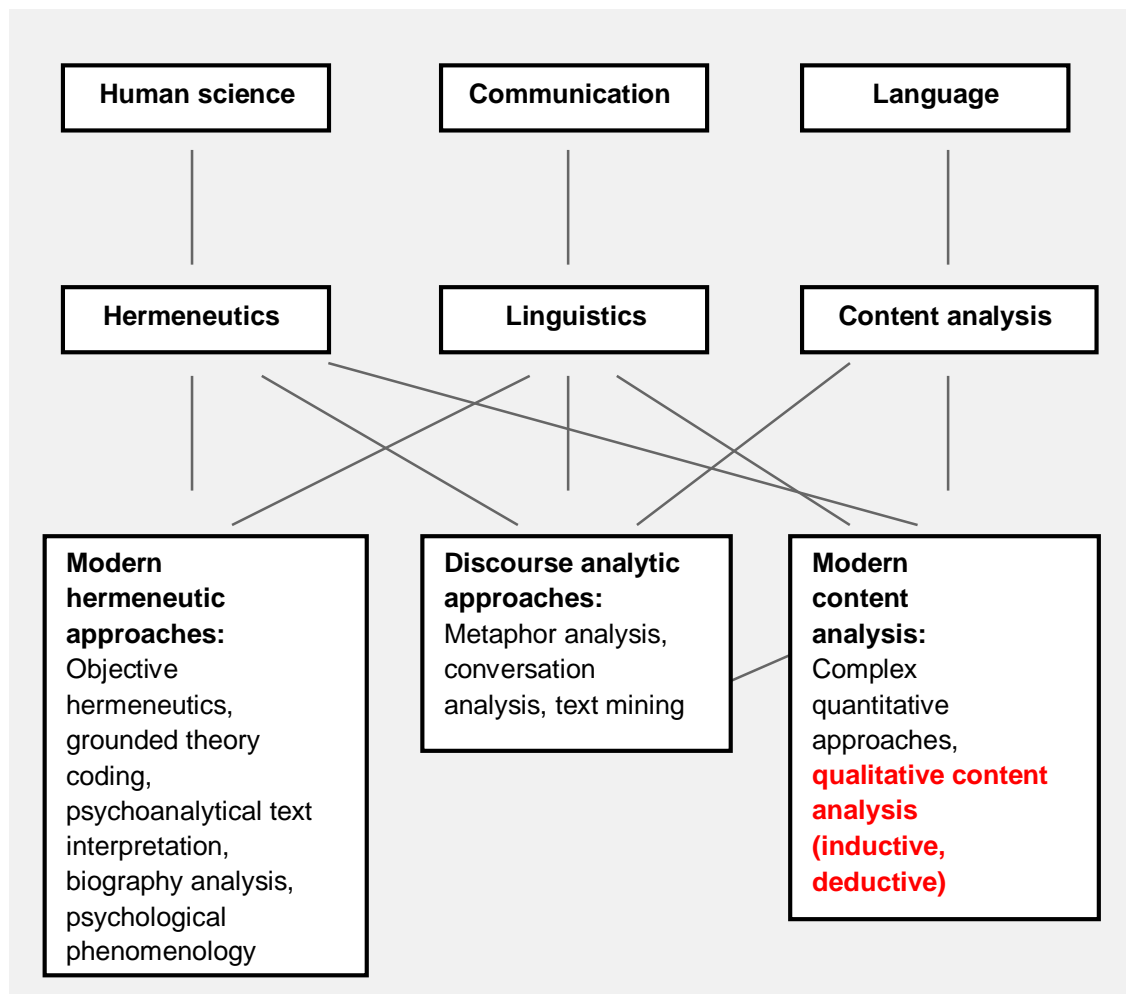


Figure 6.1: Approaches to social science text analysis

Source: Mayring (2014)

6.2.1 Research questions and relevance

As elucidated in Chapters 2, 3 and 5, the research aim is to identify the important and essential attributes of a sponsor on a megaproject. The research aim has been achieved by answering the following research questions in Chapter 3:

- How is the potential megaproject sponsor identified and appointed and what are the attributes that he/she should possess?
- How do professionals in the field rank the relative importance of the attributes of megaproject sponsors (assuming not all the attributes are equally important)?
- Why are certain attributes of the sponsor on a megaproject defined as important?
- Which important attributes of a sponsor on a megaproject are considered essential for the project to be a success?
- Which psychometric and other tests can reliably assess important attributes of a potential megaproject sponsor? and

- What should the level of active participation of a megaproject sponsor ideally be in order to make a decisive impact on the success of the project?

In Chapters 2, 3 and 5 the relevance to praxis of the research was clarified as the relationships that existed between the effectiveness of the sponsor as the single best predictor of project success or failure, and the personal attributes of the sponsor directly influencing his/her effectiveness. The relationships between the attributes of the sponsor, the effectiveness of the sponsor, and project success are graphically depicted in Figure 2.2 in Chapter 2.

Mayring (2014) stated that for qualitatively focused exploratory studies (as this research is) the formulation of hypotheses was often not possible. The requirement for the formulation of hypotheses then needed to be tempered. However, qualitative thinking often included researcher-subject interaction, and this implied that the researcher conceived his/her position in advance. Such thinking could be viewed as a form of hypotheses formulation.

6.2.2 Linking research questions to theory

The premise for this step is to frame the research aim, questions and results within theory. To do this the researcher developed a broad framework for the attributes of a project sponsor as proposed by Mayring (2014).

The descriptor 'attributes' was a possible bias that could be noted in the context of this step in the qualitative content analysis process. It was found in literature that different descriptors were used to elaborate on what was inherent to the sponsor's effectiveness. For the purpose of simplicity and consistency, the researcher decided to use the term 'attributes'. This was supported by the fact that the work by Helm and Remington (2005), which used this descriptor, was also cited by Cooke-Davies, Crawford, Hobbs, Labuschagne and Remington (2006), Kloppenborg, Manolis and Tesch (2009); Kloppenborg, Tesch and Manolis (2011), Labuschagne, Cooke-Davies, Crawford, Hobbs and Remington (2006), Sutterfield, Friday-Stroud and Shivers-Blackwell (2006) and Walker (2012).

The work by Helm and Remington (2005) was used as the basis to begin the process of developing a broad overarching framework for sponsor attributes. The summarised array of attributes identified for inclusion in the broad sponsor attributes framework is provided in Chapters 2 and 3.

Although the focus of this chapter is on qualitative content analysis, it should be noted that the array of sponsor attributes identified from literature was used for both the survey questionnaire and semi-structured interview data gathering and analysis processes. The involvement of the literature-based array of sponsor attributes in the interview process took

place post completion of all the interviews while defining the category system to be used for the qualitative content analysis in the research.

It should also be noted that the attributes identified from literature were not specifically for megaprojects. There were, however, literature sources that did reflect on the inclusion of large or megaproject sponsors when attributes were discussed. These references included Helm and Remington (2005) and Remington (2011), in addition to the APM (2018). The researcher contends that the array of sponsor attributes identified from literature is thus inclusive of the megaproject perspective. The participants in the survey questionnaires and the semi-structured interviews were all individuals with megaproject experience. Both the interviews and questionnaires were completed in the context of their megaproject experience. They did not find it difficult or necessary to differentiate between attributes for projects in general and attributes for megaprojects specifically. The interviewees were also invited to indicate additional attributes that they thought were not already part of the list identified from literature.

Clarification of the process of data gathering and analysis for the survey questionnaire is provided in Chapter 5. For the sake of completeness, the array of attributes identified from literature is as follows:

1. Appropriate seniority, credibility and (personal and positional) power within the organisation. Credibility understood in terms of being accepted by organisation and stakeholders as suitable for the role*;
2. An understanding of the strategy of the organisation, the need to obtain regular updates on the strategy and an appreciation of how the project contributes to the corporate strategy;
3. Political knowledge of the organisation and being politically savvy;
4. An understanding of the role, its significance, and the need to align the project with the interests of the organisation;
5. The competence (i.e., the combination of knowledge, personal attitude and skills) to fulfil the role;
6. Ability to provide clarity of direction (including the development of a compelling vision) within the context of the strategy and governance arrangements of the organisation;
7. Sufficient knowledge of the business and its operations, market and industry to be able to make informed decisions;
8. Ability to engage by being willing to take personal ownership and acting in the long-term interest of the organisation (demonstrating loyalty, motivation and commitment);
9. Ability to provide leadership consistent with the culture and values of the organisation;

10. Ability to manage self, i.e., to manage him/herself effectively within the time commitment agreed (both short- and long-term), with time management (personal and priority) being a significant part of self-management;
11. Ability to take a holistic view (see the big picture) and engage peers in the organisation for advice and support for key decisions*;
12. Ability and willingness to provide objectivity to the project team and challenge the project assumptions (including a push to explore meaningful alternatives to maximise value)*;
13. An understanding and willingness to explore how complexity can manifest in projects*;
14. Interpersonal and critical thinking skills, including the ability to work with and handle ambiguity, particularly when dealing with complex projects*;
15. Ability to demonstrate high-level and diverse communication skills, including the ability to listen and to communicate relevant organisation-wide issues to the project team*;
16. Ability to foster an atmosphere of trust and open communication with the project manager and the project team;
17. Ability to exhibit a high capability for self-reflection and willingness to engage other experts in problem-solving*;
18. Ability to develop and foster (high-level) connections between and within the organisation and the project team*;
19. Ability to demonstrate personal compatibility with other key players in the organisation*;
20. Ability and willingness to serve as a focal point for decisions beyond the scope of authority of the project manager;
21. Ability to act swiftly and decisively and take responsibility for decisions;
22. Ability to provide motivational support for the project team when the going gets tough*;
23. Willingness to partner with the project manager and team to deliver project objectives*;
24. Ability to lead for results and success by conveying a sense of urgency and focusing on what matters most;
25. Ability to delegate authority to appropriate levels and provide ad-hoc support to the project team rather than to micromanage*;
26. Good negotiation skills, particularly in the context of providing or securing the availability of resources (financial, people or other) for the project manager;
27. The tenacity to break down barriers;
28. An understanding of business case development and seeks input and consensus on the contents of the business case with executives in the organisation;
29. An understanding of basic project management concepts and understands and can comment constructively at a high level on scope, risk, schedule, and cost management*;
30. Ability to understand and respond to the results of independent reviews of the project and to hold the team accountable for such results;

31. Ability to promote knowledge creation and reuse, and being open to learning; and
32. Continuity of the sponsor on the project to be evident throughout the lifecycle of the project.

* Attributes identified by Remington (2011) include complex projects specifically.

An appraisal of the attributes listed in the broad framework may suggest that a single individual was unable to fulfil the full spectrum of attributes. Remington (2011) supported this perspective with the additional comment that the right teams could fulfil all the attributes. James, Rosenhead and Taylor (2013) shared this perspective that all the attributes were rarely found in one person. Similarly, De Klerk (2014) stated that the list of recommended leadership characteristics and traits prescribed in the literature were unrealistically comprehensive and optimistic. For the research the terms 'characteristics' and 'traits' have been incorporated in the term 'attributes'.

6.2.3 Definition of the research design

Mayring (2014) differentiated between five basic research designs, i.e., explorative, descriptive, correlational, causal and mixed designs. Further analysis of the wording used to describe the five basic research designs indicated that the descriptive design best suited the approach followed by the researcher. The specific wording was as follows (Mayring, 2014, p. 12):

'Working through the texts with a deductively formulated category system and registering the occurrence of those categories, in a nominal way (a specific category has been found in the material) or in category frequencies.'

Additionally, the researcher was required to register the occurrence of the categories, in a nominal or in an ordinal way, i.e., category frequencies (Mayring, 2014).

6.2.3.1 Definition of the category system (main categories and subcategories) from theory

There were two formats in which a category system could be deductively formulated, i.e., analysing the text with:

- A nominal category system. A nominal (or qualitative) category system consisted of a list of independent categories. Their similarity lies therein that they belonged to the same structuring dimension; and
- An ordinal category system. An ordinal category system typically reflected grading categories in a fixed order, e.g. excellent, good, average, poor (Mayring, 2014).

The list of 32 attributes as documented can be described as a nominal category system. The only similarity between the categories in the system is that they all belong to the same structuring dimension, i.e., attributes.

6.2.3.2 Definition of the coding guideline (definitions and coding rules)

As can be noted from the research aim and supporting research questions provided earlier, distinguishing between the important and essential nature of the attributes is incorporated in the research. The assumptions made in this regard were that:

- All 32 listed attributes were not equally important;
- A normal human being had a limited capacity and could accommodate only a certain number of attributes; and
- Certain very important attributes needed to be possessed by the sponsor to improve the probability of project success. These very important attributes were referred to as essential attributes.

As contextualised in Chapter 5 and for the purpose of administering the survey questionnaire component of data collection, the interviewees were requested to limit their responses to 10 to 15 for important attributes. They were also requested to select from the number of important attributes only five to 10 they regarded as essential attributes. The same reasoning was explained to the interviewees during the interview process. It so transpired that none of the interviewees managed to identify more than 10 attributes as important during the interview. Only a limited number of interviewees subsequently identified more than five essential attributes.

For coding purposes, the wording used to describe the attributes in literature was also used for initial coding.

6.2.4 Defining the sample and the sampling strategy

A total of 10 megaprojects (industrial and infrastructure) with a profit motive in the South African context from multiple sites were identified for possible selection for the study. These projects met the US\$1 billion threshold as defined by Flyvbjerg (2014) and Merrow (2011) for megaprojects. From the 10 projects, six were selected. The selection was based on the accessibility and availability of senior managers and consisted of three private and three public sector megaprojects, each with a value greater than US\$1 billion at time of sanctioning of funds. All were completed since 2006. The six cases remained within the range of four to 10 case studies required for multiple-case study research (Easton, 2010; Eisenhardt, 1989).

Interviews for the six projects were conducted with the participants whose titles and roles are shown in Table 4.5 in Chapter 4 (a further description of the participants' work experience is provided in Appendix E). In total 26 individuals were interviewed.

6.2.5 Methods of data collection and protocol for the interviews

As contextualised in Chapter 4, for each case (megaproject) data - in addition to a survey questionnaire - was collected via semi-structured interviews at three organisational levels, i.e., board or executive management, sponsor and project manager.

Different interview guides were developed for the respective organisational levels.

The interview guides are appended for the:

- Member of the board or executive management of the organisation responsible for appointment of the sponsor (Appendix A);
- Sponsor appointed on a megaproject (Appendix B); and
- Project manager appointed on a megaproject (Appendix C).

Half of the questions in the interview guide explored the important and essential attributes of a sponsor of a megaproject in a neutral manner, i.e., not project-specific. These non-specific questions probed the 'what' and the 'why' for important and essential attributes.

For the other half of the questions the views of the interviewees were solicited for project-specific issues such as:

- How the potential sponsor was identified and appointed;
- The reaction of the sponsor to unforeseen circumstances;
- Psychometric and other tests that could be used to reliably assess the important attributes of the sponsor;
- The level of active participation and continuity of the sponsor whilst on the project; and
- The success (or not) of the project measured with criteria as described by Merrow (2011).

A pilot case study was used in the research to validate the appropriateness of the survey guide questions, to improve the plans for data collection, and to determine the effective line of questioning (Yin, 2014). These objectives were achieved.

The interviews were conducted either at the offices of the interviewees, the home of the researcher or a neutral venue according to the preference of the interviewee. The interviews were recorded on tape and then transcribed in typed form. The individual performing the transcriptions was requested to follow a pure verbatim translation protocol. All enunciations from the audio file were included and the transcripts were very close to the natural spoken word. Reading thereof did not pose a problem for the researcher.

6.3 DATA ANALYSIS USING ATLAS.TI APPLICATION

ATLAS.ti is a software development toolset that facilitates the qualitative analysis of large volumes of data (text, graphics, audio and video). It provides a selection of tools for performing the tasks related to any systematic approach to data that is unstructured. This implies it is very suitable to analyse data that cannot be analysed in a meaningful manner through statistical approaches. During such qualitative analysis, the ATLAS.ti software assists the individual analysing the data to investigate complicated hidden facets of the data. It did this through applications that could 'manage, extract, compare, explore, and reassemble meaningful pieces from large amounts of data in creative, flexible, yet systematic ways' (Frieze, 2019, p. 8).

The 25 transcribed interviews were coded by assigning labels to quotations in the transcriptions that related to the attributes of the sponsor. It should be noted that there were 25 interviews involving 26 interviewees. One of the interviews was held with two interviewees participating in the same interview. The interviewees involved were the two sponsors on the Collieries replacement/ expansion programme. Given that they were of equal stature in their organisation they did not hesitate to offer their own opinions. In a certain sense the interview was *de facto* a mini-focus group discussion and rich in perspectives provided. The transcription of the interview identified what each individual had said. This led to 26 separate participants as the individuals filled in separate survey questionnaires.

The process of assigning labels to quotations was known as 'first cycle coding' (Saldaña, 2010). The assigning of the codes was assisted by the use of the attribute list derived from literature as indicated in Section 6.2.

When the situation arose that the attributes derived from the literature were not adequate to describe a quotation, additional codes were defined. Simultaneously each quotation was also provided with a label that indicated whether it belonged to the essential or to the important categorisation. It should be understood that if a quotation was given an essential code it meant that the quotation belonged, by default, also to the important category. Certain quotations, however, belonged to the important category only with no essential connotation.

The first-cycle codes were categorised into a smaller number of groups (or families) of codes. These groups of codes were structured to indicate quotations belonging to the essential or important categorisation and happened when the interview questions had either an important or essential focus. This was referred to as 'second-level coding' (Volschenk, 2016). Saldaña (2010) described this as 'axial coding' that was based on the understanding that an axis pulled together a group of codes. In the context of data analysis as viewed by

Miles and Huberman (1994), three concurrent flows of activities occurred. The first concurrent flow, when performing second-level coding, was described as 'data reduction'.

Miles and Huberman (1994) described the second concurrent flow of activities as 'data display'. This is where data was reduced through a display of the data in tables, figures, etc. It not only provided a way to reduce the data but also allowed a clear understanding of the data.

The last concurrent flow of activities described was 'conclusion drawing and verification' (Miles & Huberman, 1994). The drawing of conclusions and noting of structures, patterns, relationships, etc. already commenced at the beginning of data collection (Robson, 2002). Whilst the data analysis in the research searched for reciprocal reasoning from the interviews pertaining to the attributes of the sponsor, it also searched for differing perspectives. In practical terms the data analysis searched for attributes that were not already stated in existing literature.

It became apparent early in the process of conducting the interviews that a number of differing perspectives on the attributes of the sponsor, as well as further refining of the wording describing an attribute as identified in the literature, would be provided. The additional attributes, not necessarily identified as standalone attributes in the literature, are expanded on in the following section.

Data display, and conclusion drawing and verification for the qualitative content analysis component of the research commenced when the number of interviewees registered a specific attribute and the attributes registered were graphically displayed. It should be noted that the term 'code' was used in the interim and until the end of this section is referred to as 'attribute'.

For these graphic displays a bar chart format was used. The graphic display was done for two scenarios, i.e., essential attributes and essential plus important attributes. The researcher did not encounter a situation where an interviewee mentioned a specific attribute as part of both the important and essential attribute questions.

The following thought process was then applied to draw conclusions from the figures created:

1. It is clear from Chapter 1 that essential attributes are a higher order of important attributes. They can be coupled with the success of the project. To improve the probability of project success, the sponsor is required to possess a number of essential attributes. By default it implies that all essential attributes are important but not all attributes categorised as important are essential.

2. From the figure representing the list of essential attributes, the number of essential attributes that a sponsor on a megaproject should possess was determined. For this and the list of important and essential attributes the following issues are important:
 - 2.1 As explained in Chapters 2, 3 and 5, it could reasonably be expected that a sponsor should possess in the range of five to 10 such attributes, where seven was the practical number;
 - 2.2 Since the sponsor on a megaproject was likely to be selected from the senior echelons of management, it was reasonable to expect that the attributes that he/she possessed would tend to the upper end of this range of five to 10.
 - 2.3 Chapter 5 provides an indication of the change in votes per attribute by the survey questionnaire respondents (as in Figures 5.1 and 5.2 in Chapter 5). The number of votes per attribute decreased rapidly between each of the first five attributes. Thereafter the drop-off in votes per attribute was markedly smaller. A similar decrease for the first five attributes was expected for the number of interviewees mentioning the attribute.
 - 2.4 The first five attributes most frequently mentioned as essential were listed. Thereafter attributes were mentioned as essential by similar or a fewer number of interviewees going down the list of attributes. A reduction of more than two (number of interviewees mentioning an attribute) was considered a material drop-off. If this occurred before 10 attributes, it would be regarded as the list reflecting the number of interviewees who mentioned an attribute as essential. Alternatively, the list would be cut off at 10 attributes that were mentioned as essential by the highest number of interviewees. It should be noted that up to this point there was no inclusion of interviewees' mention of attributes as important.
 - 2.5 To make this practical the following example is provided. If immediately after the top five attributes most frequently mentioned as essential a material drop-off in number of interviewees mentioning an attribute is observed, then the number of essential attributes for the scenario is five. However, if there is no material drop-off in the range from five to 10, a further five attributes can be accommodated and the decision is to regard the first 10 attributes as essential;
 - 2.6 For the material drop-off case, the five attributes are referred to as the top-five attributes and five is considered the practical limit for the determination of essential attributes. In the case where there is no material drop-off in the range, the 10 attributes are referred to as the top-10 attributes and 10 is considered the practical limit. If in the same example only three further attributes can be

accommodated because there is a material drop-off immediately after the eighth attribute, then the reference is top-eight and the practical limit is eight; and

- 2.7 There was a limited number of important but not essential attributes. The identification of these attributes was required because it may not always be possible to identify a potential sponsor who possessed all the essential attributes. These attributes could be of distinct assistance or advantage for executive management during the assessment of candidates for the sponsor role.
3. As described in points 2.4 to 2.7, a list of attributes reflecting the number of interviewees who mentioned the attributes as essential would now be available in the thought process. Similarly, a list of attributes was then compiled reflecting the number of interviewees who mentioned an attribute as essential plus the number of interviewees who mentioned the same attribute as important. This is where the mention of an attribute by an interviewee as important became part of the discourse. The two lists (essential and essential plus important) did not necessarily have to contain the same number of attributes and could differ because the material drop-offs per list could be different. The lists were then compared to identify those attributes that were common and those that were not common (to both lists). The attributes that were common to both lists were referred to as essential attributes. The total list of attributes identified (common and not common) was subsequently depicted in a figure where it was possible to identify those attributes that were common to both lists separately from those that were not common to both lists;
4. The attributes that were not common to both lists were then further evaluated to determine if a motivation could be established for inclusion in the list of essential attributes. An example is the motivation in Chapter 5 for the inclusion of two attributes (of the four attributes not in common) in the top-eight essential attributes of the survey questionnaire methodology. Six essential attributes were identified that were common to both lists. For two of the four attributes that were not common there was sufficient motivation for inclusion in the top-eight of the essential attributes list;
5. From the Chapter 5 reference, two attributes remained that were not in the top-eight list of common essential attributes identified. These two attributes were subsequently referred to as important but not essential attributes; and
6. To determine if other attributes existed that should be regarded as important but not essential, it was necessary to evaluate an additional number of attributes beyond the cut-off point for the essential list. If these attributes were mentioned in the discussion of important attributes, it would add additional weight to include them as important but not essential attributes. A practical approach was to contain the number of important but not

essential attributes within a range. This range was determined in a similar way in which the essential attributes range was determined.

6.4 RESULTS FROM ATLAS.TI APPLICATION

The first-cycle coding exercise with the ATLAS.ti application resulted in the generation of 66 codes. Given the cumbersome nature of such a high number, the codes were thoroughly scrutinised for duplications and for the use of multiple codes with the same meaning. This resulted in a reduction from 66 codes to 37.

The 66 codes resulting from the first run-through of the interview material utilising the category system described in Section 6.2 is indicated as follows in a report extracted from ATLAS.ti.

Sixty-six codes identified (after run-through of interview material completed):

1. Ability and willingness to partner with project team;
2. Ability to act swiftly and take responsibility for decision-making;
3. Ability to apply discipline;
4. Ability to be approachable;
5. Ability to be insensitive or unemotional when required;
6. Ability to be open to learning or to transfer learning;
7. Ability to be structured and predictable;
8. Ability to be visible for team;
9. Ability to buffer the project manager and team when cover is required;
10. Ability to celebrate success;
11. Ability to communicate (at a high level) and listen;
12. Ability to deal with all phases of business development and implementation in a typical project lifecycle model;
13. Ability to deal with ambiguity;
14. Ability to delegate authority, support the delegation, keep project manager accountable and not get into detail;
15. Ability to develop and foster relationships and connections (networking) and demonstrate compatibility with key players in the organisation;
16. Ability to drive for results;
17. Ability to engage, take personal ownership or demonstrate commitment;
18. Ability to ensure discipline and governance;
19. Ability to evaluate situation analytically;
20. Ability to foster an atmosphere of trust and transparency;

21. Ability to identify, map and manage stakeholder expectations, including across business units;
22. Ability to integrate, coordinate, organise or facilitate from a leadership perspective;
23. Ability to lead for results and focus on what matters most;
24. Ability to learn and adapt;
25. Ability to make decisions and hold people accountable;
26. Ability to manage complexity;
27. Ability to manage conflict;
28. Ability to manage interfaces between business entities;
29. Ability to manage safety holistically;
30. Ability to manage self and own skills set;
31. Ability to move forward through adversity, and resilience;
32. Ability to organise, coordinate and integrate;
33. Ability to provide clarity of direction (including ability to develop compelling vision);
34. Ability to provide leadership in the context of culture and values;
35. Ability to provide motivational support when the going gets tough;
36. Ability to provide objectivity and challenge the project team in a complex situation;
37. Ability to remain calm in complex and pressurised conditions;
38. Ability to see the big picture, take a holistic view and take advice from others;
39. Ability to select the team and select and keep the right people;
40. Ability to sell the business case for the project;
41. Ability to serve as focal point for decisions beyond the scope of the project manager and act as a 'barrier buster';
42. Ability to understand and manage the impact of change;
43. Ability to understand and manage risk, both externally and internally;
44. Ability to understand basic project management;
45. Ability to understand basic project management and has project experience;
46. Ability to understand the strategy of the organisation, link business and project objectives to strategy and provide focus;
47. Ability to understand the technology and engineering involved;
48. Ability to understand and respond to results of independent reviews;
49. Ability to use judgment;
50. Ability to use judgment and deal with compromises and trade-offs based on experience;
51. Believe that continuity of the sponsor is important or essential;
52. Knowledge of politics of the organisation, being politically savvy and astute in politicised South Africa;

53. A safety orientation;
54. A safety orientation and the management of safety;
55. Analytical abilities;
56. Business, legal, financial and commercial acumen and astuteness to ask probing questions;
57. Determination, drive, and tenacity;
58. Has experience in and is knowledgeable from both a contractual and institutional perspective;
59. Good negotiation skills;
60. Interpersonal and critical thinking skills and can work with ambiguity;
61. Project experience and technical knowledge;
62. The competencies (includes knowledge, personal attitude and skills) for the role;
63. Determination or ability to drive, tenacity and courage;
64. Senior, empowered and accountable person with personal and positional power and credibility;
65. Understands the needs of business, the business case and the customer (market); and
66. Understands the role of the sponsor.

Checking for duplications, multiple codes with the same meaning, and possible reconfiguration of the listed 66 codes occurred after the processing of all the interview material had been completed. The verb 'integrated' used below also implies collapsed, included and merged. The actions that were implemented are indicated in Table 6.1 as follows:

Table 6.1: Integration of codes

Code identified for integration	Code(s) integrated into
Code #2	Integrated into Code #25
Code #3	Integrated into Code #7
Code #4	Integrated into Code #1
Code #5	Integrated into Code #27
Code #6	Integrated into Code #30
Code #8	Integrated into Code #4; result integrated into Code #1
Code #9	Integrated into Code #1
Code #12	Integrated into Code #45
Code #13	Integrated into Code #60
Code #16	Integrated into Code #63
Code #18	Integrated into Code #3; result integrated into Code #7
Code #19	Integrated into Code #60
Code #23	Integrated into Code #63
Code #24	Integrated into Code #30
Code #26	Integrated into Code #36
Code #28	Integrated into Code #45
Code #29	Integrated into Code #43
Code #31	Integrated into Code #63
Code identified for integration	Code(s) integrated into
Code #32	Integrated into Code #22
Code #42	Integrated into Code #1
Code #44	Integrated into Code #45
Code #46	Integrated into Code #33
Code #48	Integrated into Code #30
Code #49	Integrated into Code #50
Code #53	Integrated into Code #54; result integrated into Code #29; result integrated into Code #43
Code #54	Integrated into Code #29; result integrated into Code #43
Code #55	Integrated into Code #19
Code #57	Integrated into Code #63
Code #61	Integrated into Code #45

All the above actions resulted in a list of 37 codes (with the descriptions of the codes provided). A list with the numbering from the list of 66 codes has been carried through to the list of 37 codes so that an audit trail can be established and is provided as Appendix F. Enhanced wording, resulting from the actions of integration (i.e., merging, inclusion and collapsing) is provided in the descriptions of the codes.

At this juncture it should be indicated that during the run-through of the interview material it was recognised that the interviewees very regularly during the interviews oscillated between 'knowledge of the business and its operations, market and industry' (wording of attribute #7 of 32 in Section 6.2.2) and 'understanding of business case development' (wording of attribute #28 of 32 in Section 6.2.2). They dealt with the two codes as if they were one concept.

The business case typically described the justification for doing the project, objectives and key targets to be achieved, and scope of the project and provided a summary of the investment analysis from a profitability and risk perspective (Barshop, 2016, p. 203). The sponsor tested the robustness of the business case regularly as the project scope definition evolved, i.e., from feasibility study to final investment decision to post-project implementation audit.

Overall, the preparation of the business case and the ownership thereof were responsibilities of the sponsor. Two key inputs to the business case were the analysis of the market and the delivery capability of the scope to be completed. The sponsor did not typically do the market forecast used in the justification for the project but ensured that the forecast had been tested rigorously. A very good knowledge of the market and customers of the business by the sponsor was implied.

Similarly, the sponsor ensured that the delivery capability of the scope to be completed had been tested rigorously. In this case a very good knowledge of the capability of the business by the sponsor was implied. The executive managers that the sponsor reported to and the project manager that reported to the sponsor depended on the sponsor to ensure that the rigour referred to was achieved.

From the clarification provided it is clear that there were distinct common issues between 'understanding of business case development' and 'knowledge of the business, operations, market or industry'. It is therefore understandable that the interviewees may not have strictly contained themselves to a specific description of the attributes involved during the interviews. The applicable responses were accordingly collapsed into one code, i.e., 'understanding of business case development and knowledge (of the needs) of business, operations, market and industry'. The following quotations provided a perspective on the manner in which certain interviewees oscillated between 'business' related matters in a single speaking opportunity.

'I think the understanding of the business case and the ability to interact with the project financial model to ensure that all of these elements, the technical track, the business track and the project track can be appropriately challenged and guided by the sponsor [is essential].'
(executive manager)

'I think there are a few, I guess, [that] the textbook will tell you about the business case. I actually think the business case is great but it's the business acumen you need on megaprojects. It's not the business case *per se*, there is a lot of clever ones that can run NPVs, ROIs [etc.] and all the

good stuff and there's a whole process and system to check assumptions, but it really [is] having a bit more than that. So *ja* [yes], if you ask me, I don't think – if you want to – you almost need that business understanding, a bit deeper, how the Sasol business model to some extent works and where it doesn't work so that you can make it a success. So *ja* [yes], I think that kind of worked for [me] – I think that's [very] important.' (sponsor)

'My feeling is the sponsor is actually the guy that must make sure that the project is a business success. So I think he needs to understand what the business objectives are and what the business needs.' (project manager)

It is a moot point to consider how the collapsing of the two codes (business versus business case) into one may affect the outcome of the survey questionnaire analysis as provided in Chapter 5.

Analysis of detail in the survey questionnaire responses indicated that 15 out of the possible 26 respondents voted for both attributes. The votes were split seven 'essential' and eight 'important' for the 'sufficient knowledge of the business and its operations, market and industry to be able to make informed decisions' attribute. Similarly, the votes for the 'understanding of business case development and seeks inputs and consensus of the business case with executives in the organisation' attribute were split eight 'essential' and seven 'important'. Of the 37 votes cast for both attributes, 30 were in the hands of the abovementioned 15 respondents. The remaining seven votes were all 'important' votes, with no additional 'essential' votes forthcoming. The split between the two attributes was 4/3 for the remaining 'important' votes.

This distribution of votes for the two attributes indicated that if only one attribute addressing knowledge of the business or understanding of business case development was on the list of 32 attributes, it would have generated a result that was dominated by the response from 15 respondents. The potential split of votes for the one attribute would have approximated a distribution of eight 'essential' and 11 'important' votes. This distribution of votes would not have resulted in the attribute being a 'first-in-line' contender for a place in the top-eight essential attributes identified from the survey questionnaire. From Figures 5.1 and 5.2 in Chapter 5 it could be deduced that the 'understanding of business case development' component of the collapsed attribute was located in the centre of the important tranche of attributes.

A comparison of the list of codes (now numbered from 1 to 37) with the wording of the list of 32 attributes identified from literature (as listed in Section 6.2.2) is as follows. It should be acknowledged here that part of the comparison required dealing with similarity and required

aspects of interpretation. The interviewees mentioned certain attributes that were combinations of attributes from the list from the literature. The researcher then needed to explore how the attributes mentioned connected to the attributes identified from literature.

In the comparison the additional (not previously encountered in literature as standalone) attributes are indicated with an asterisk (*) and an indication is provided in brackets of how the other codes link to attributes from literature (wording as indicated in list of 32 literature-derived attributes in Section 6.2.2):

1. Ability and willingness to partner with project manager and project team to deliver on objectives (Listed as #23 of 32);
2. Ability to follow a structured thinking process and ensure that governance for the project is in place*;
3. Ability to celebrate also the smaller successes on the project at a regular frequency*;
4. Ability to demonstrate high-level and diverse communication, including the ability to listen (Listed as #15 of 32);
5. Ability to delegate authority to appropriate levels, support the delegation, provide ad-hoc support, keep project manager accountable and not micromanage (Listed as #25 of 32);
6. Ability to develop and foster (high-level) relationships and connections (networking) and demonstrate compatibility with key players in organisation (Listed as #18 and #19 of 32);
7. Ability to engage, demonstrated by taking personal ownership, showing commitment and loyalty, and acting in the long-term interest of the organisation (Listed as #8 of 32);
8. Ability to foster an atmosphere of trust and transparency with project manager and team (Listed as #16 of 32);
9. Ability to identify, map and manage stakeholder expectations, both internally and externally*;
10. Ability to integrate, coordinate, organise or facilitate key issues on the project from a leadership perspective*;
11. Ability to make decisions swiftly, take responsibility for the decisions and hold individuals accountable for outcomes (Listed as #21 of 32);
12. Ability to manage conflict, particularly with those parties outside the authority of the project manager*;
13. Ability to manage self and own skills set, exhibit high capability for self-reflection, be open to learning from independent project reviews, engage other experts in problem-solving and adopt best practices where appropriate (Listed as #10, #17, #30 and #31 of 32);

14. Ability to provide clarity of direction (includes the ability to develop a compelling vision, understanding strategy of organisation, appreciating linkage between business or project objectives and the corporate strategy, and focus on results) (Listed as #2, #6 and #24 of 32);
15. Ability to provide leadership in the context of the culture and values of the organisation (Listed as #9 of 32);
16. Ability to provide motivational support for the project team when the going gets tough (Listed as #22 of 32);
17. Ability and willingness to provide objectivity to the project team and challenge the project assumptions for meaningful alternatives to maximise value in a complex or complicated environment (Listed as #12 and #13 of 32);
18. Ability to remain calm in a complex or complicated environment in pressurised conditions*;
19. Ability to take holistic view (see the big picture), engage peers and take advice from others for key decisions (Listed as #11 of 32);
20. Ability to select and keep the key players on the project team and assist the project manager to select and keep the right people at lower levels in the team*;
21. Ability to sell the business case for the project*;
22. Ability to serve as focal point for decisions beyond scope and authority of the project manager and act as 'barrier buster' when required (Listed as #20 of 32);
23. Ability to understand and manage safety and risk, both externally on and internally to the project*;
24. Ability to understand (at the appropriate high level) the technology or engineering and other technical aspects involved in the project*;
25. Ability to use judgment and deal with compromises or trade-offs based on experience*;
26. Appropriate senior, empowered and accountable person with (personal and positional) power and credibility. Credibility understood in terms of being accepted by organisation and stakeholders as suitable for the role (Listed as #1 of 32);
27. Believes that continuity of the sponsor is important or essential throughout the lifecycle of the project (Listed as #32 of 32);
28. Knowledge of politics of the organisation, being politically savvy and astute in politicised South Africa, particularly on public sector projects (Listed as #3 of 32);
29. A critical mass of business, legal, financial and commercial acumen and astuteness to ask and respond to probing questions in the broader stakeholder community*;
30. Experience in and knowledge of the industry domain of the project, from a technical, contractual and institutional perspective*;

31. Good negotiation skills, particularly in providing and securing the availability of resources for the project manager (Listed as #26 of 32);
32. Interpersonal and critical thinking skills, including the ability to deal with ambiguity (Listed as #14 of 32);
33. The competencies (combination of knowledge, personal attitude and skills) to fulfil the role (Listed as #5 of 32);
34. Determination, ability to drive, tenacity, courage or resilience when conveying a sense of urgency and focusing on what matters most in leading for results and success (Listed as #24 and #27 of 32);
35. Understands basic project management (can comment constructively at a high level on scope, risk, schedule, and cost management) and has project experience (preferably megaproject experience) (Listed as #29 of 32);
36. Understands the business, business case development, customer (market) or operations to enable informed decision-making (Listed as #7 and #28 of 32); and
37. Understands the role of the sponsor, its significance, and the need to align the project with the interests of the organisation (Listed as #4 of 32).

A separate listing of the additional codes (not previously encountered in literature as standalone attributes) identified from the interview data analysis is as follows:

- Ability to follow a structured thinking process and ensure that governance for the project is in place;
- Ability to celebrate also the smaller successes on the project at a regular frequency;
- Ability to identify, map and manage stakeholder expectations, both internally and externally;
- Ability to integrate, coordinate, organise or facilitate key issues on the project from a leadership and not a management perspective;
- Ability to manage conflict, particularly with those parties outside the authority of the project manager;
- Ability to remain calm in a complex or complicated environment in pressurised conditions;
- Ability to select and keep the key players on the project team and assist the project manager to select and keep the right people at lower levels in the team;
- Ability to sell the business case for the project;
- Ability to understand and manage safety and risk, both externally on and internally to the project;
- Ability to understand (at the appropriate high level) the technology, engineering and other technical aspects involved in the project;

- Ability to use judgment and deal with compromises or trade-offs based on experience;
- A critical mass of business, legal, financial and commercial acumen and astuteness to ask and respond to probing questions in the broader stakeholder community; and
- Experience in and knowledge of the industry domain of the project, from a technical, contractual and institutional perspective.

It was evident from the additional codes that most of them could be found in the broad definition of competence where competence was understood as the combination of knowledge, personal attitude and skills. The probability existed that the interviewees did not necessarily think about competence as an inclusive concept but rather focused on the building blocks (of competence) during the interviews. It was therefore important to consider how the competence building blocks manifested as either 'important' or 'essential' codes in the analysis of the interview data. It was also important to ask the question to what extent the survey questionnaire may have been deficient in not recognising the broadness of the attribute 'possesses the competence (i.e., the combination of knowledge, personal attitude and skills) to fulfil the role'.

ATLAS.ti used the data (recorded codes) obtained from the interviews to rank the 37 codes based on the number of times that a code was registered from the interview data. This is presented in Figure 6.2.

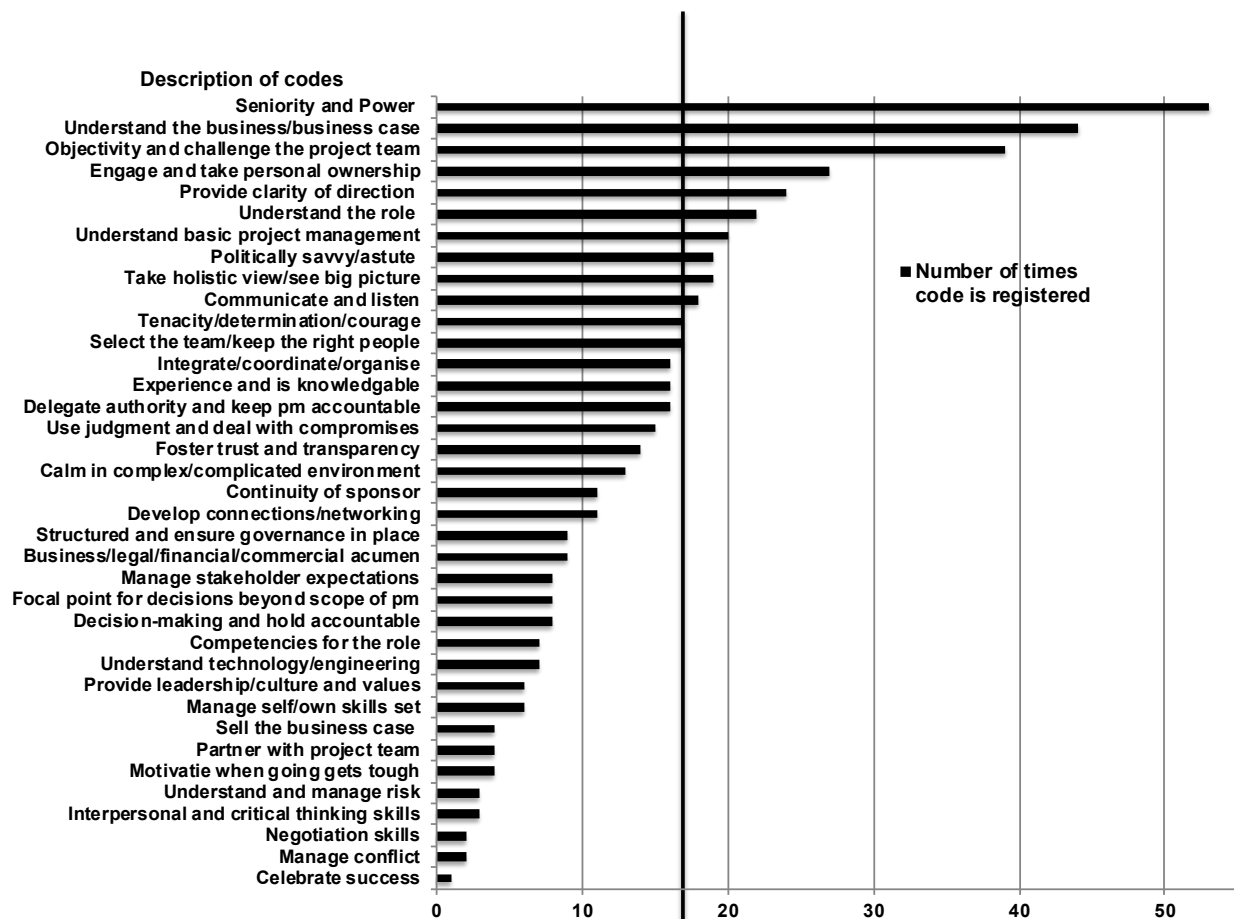


Figure 6.2: Ranking of codes identified from interviews

A potential concern with this manner of graphic portrayal (by using the number of times a code is registered by the analyst, the researcher in this case) was the imbalance in the code frequency or frequencies that may be created by over-emphasising a specific code(s) during a coding exercise. It should be noted that it was possible for a particular code to be mentioned more than once by the same interviewee under the same question, e.g. essential attributes. The researcher did not encounter a situation in which a specific code was mentioned as both important and essential by an interviewee.

However, if the concern was set aside momentarily, Figure 6.2 indicates that the important and essential codes identified from the number of codes registered are as follows. The assumption is made that there is a practical limit at 10 codes on the vertical axis, reading from top to bottom, in Figure 6.2. As per the thought process explained in Section 6.3, this number is arrived at giving more consideration to the capacity of the 'normal' person (a range of five to 10) to accommodate the attributes associated with the code descriptions than to the quantum of the drop-off.

The top-10 codes in Figure 6.2 are:

1. Appropriately senior, accountable and empowered person with (personal and positional) power and credibility. Credibility understood in terms of being accepted by organisation and stakeholders as suitable for the role;
2. Understands the business, business case development, customer (market) or operations to enable informed decision-making;
3. Ability and willingness to provide objectivity to the project team and challenge the project assumptions for meaningful alternatives to maximise value in a complex or complicated environment;
4. Ability to engage by being willing to take personal ownership and acting in the long-term interest of the organisation (demonstrating loyalty, motivation and commitment);
5. Ability to provide clarity of direction (includes the ability to develop a compelling vision, understanding strategy of organisation, appreciating linkage between business or project objectives and the corporate strategy, and focus on results);
6. Understanding the role of the sponsor, its significance, and the need to align the project with the interests of the organisation;
7. Understanding basic project management (can comment constructively at a high level on scope, risk, schedule, and cost management) and has project experience (preferably megaproject experience);
8. Ability to take holistic view (see the big picture), engage peers and take advice from others for key decisions;
9. Knowledge of politics of the organisation, being politically savvy and astute in politicised South Africa, particularly on public sector projects; and
10. Ability to demonstrate high-level and diverse communication skills, including the ability to listen and to communicate relevant organisation-wide issues to the project team.

The descriptor 'code' is from here on replaced permanently with the term 'attribute' being mindful of the research aim to be achieved, i.e., determining the important and essential attributes that a sponsor of a megaproject should possess. The number of attributes that are henceforth used for analysis purposes is 37.

The interview data was also analysed to graphically portray:

- The cumulative number of interviewees indicating an essential categorisation per attribute in Figure 6.3; and
- The cumulative number of interviewees indicating an important **or** essential categorisation per attribute in Figure 6.4.

The number of interviewees indicating an essential categorisation per attribute for the total number of interviewees (N=26) in a stacked bar format and sorted from large to small is reflected in Figure 6.3.

The descriptions 'essential categorisation per attribute' and 'important categorisation per attribute' is condensed to 'essential attribute' and 'important attribute' respectively from this point onward.

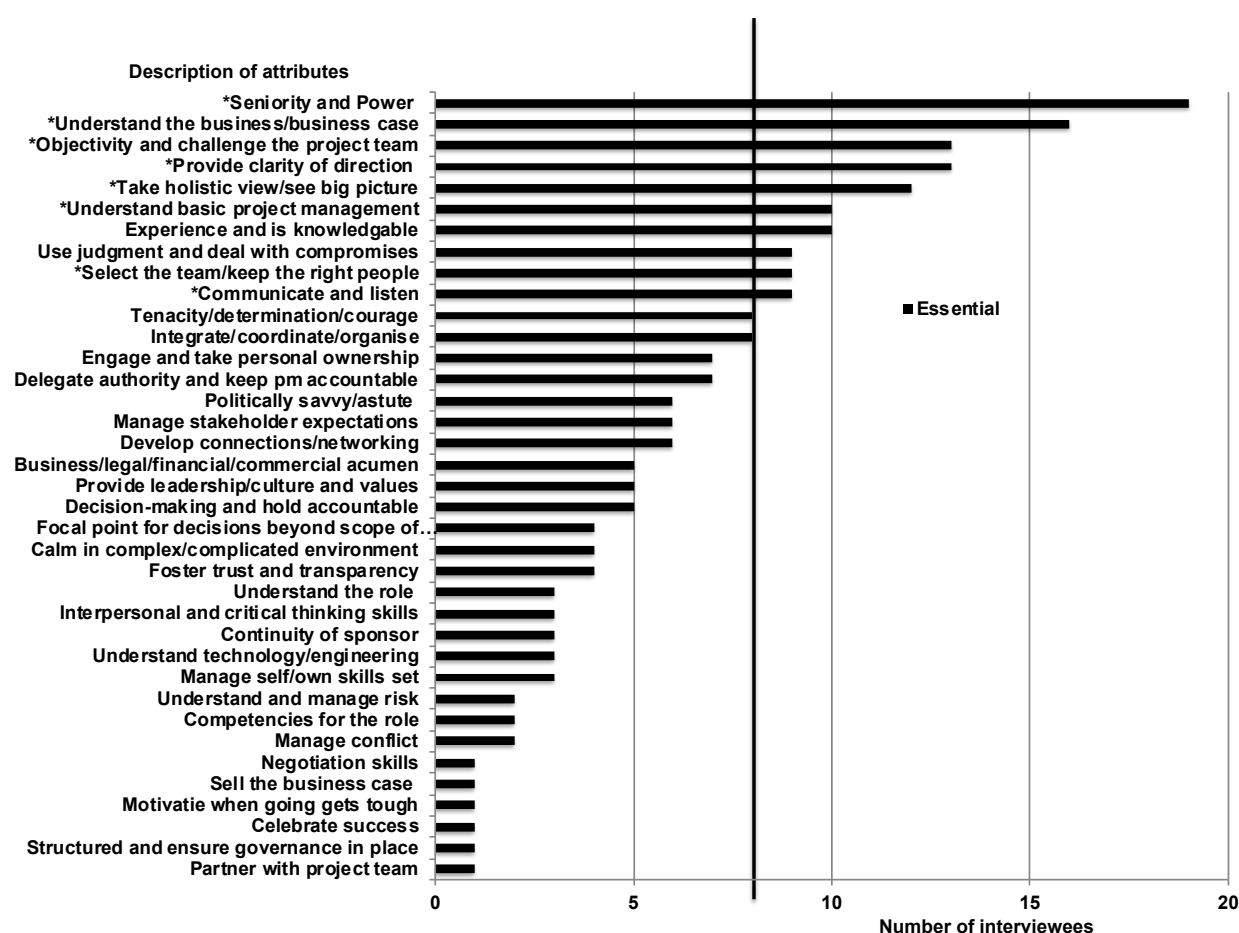


Figure 6.3: Ranking of essential attributes identified from interviews

* Attributes also found in the top-ten practical limit reading from left to right for Figure 6.4.

The number of interviewees indicating important plus essential attributes for the total number of interviewees (N=26) in a stacked bar format and sorted from large to small are reflected in Figure 6.4.

Portraying both figures brought an element of triangulation to the research. It also ensured that sufficient consideration was given to the testing for notable differences between the two scenarios, i.e., essential only and essential plus important attributes.

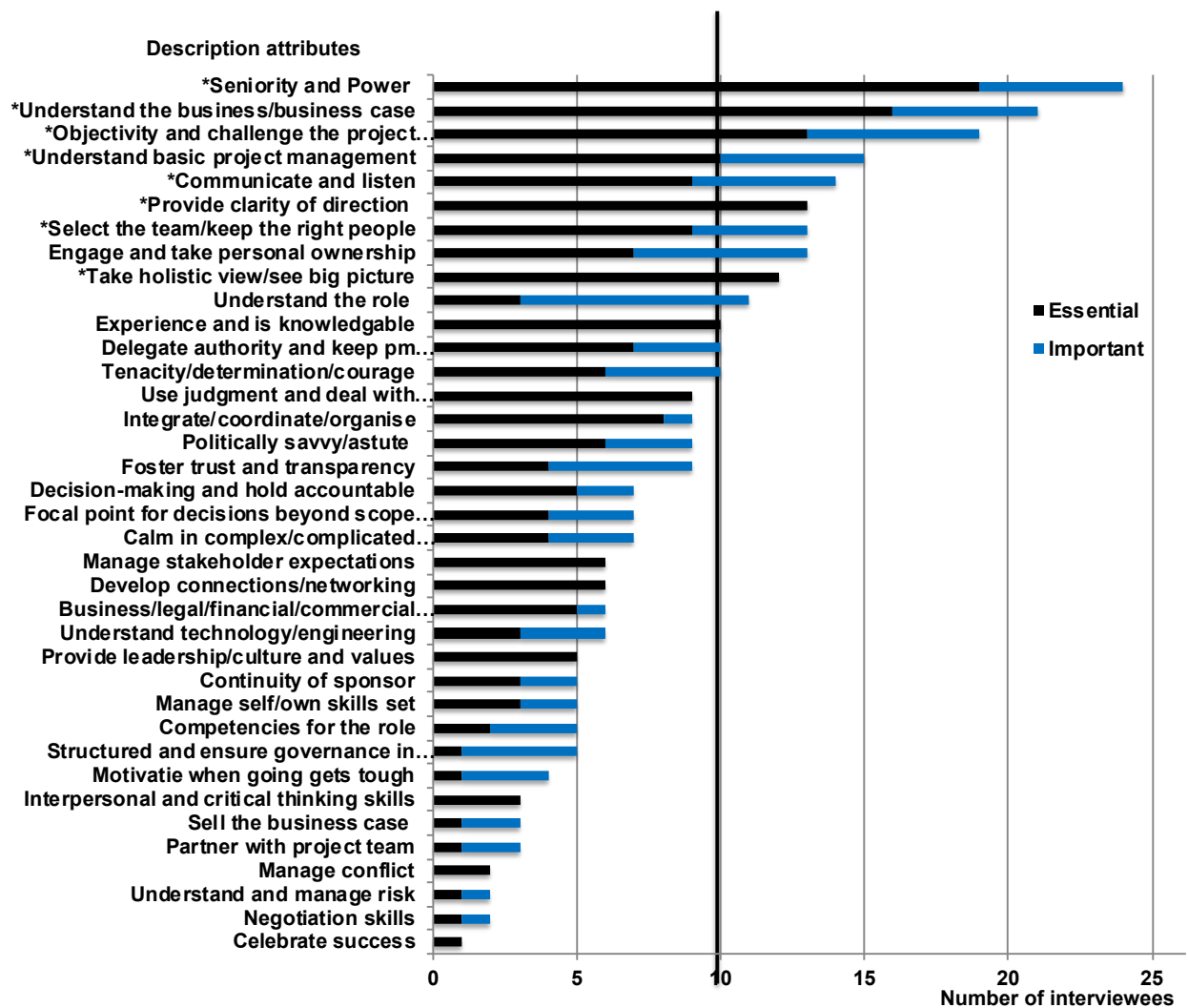


Figure 6.4: Ranking of important plus essential attributes identified from interviews

* Attributes also found in the top-ten practical limit reading from left to right for Figure 6.3.

Taking into account the limited number of attributes that may be expected in a single candidate sponsor and by evaluating Figures 6.3 and 6.4, it appeared that 10 attributes (reading from left to right) was a practical limit to use for determining the essential attributes for further consideration.

Attributes #1 to #10 in Figure 6.4 formed part of a group driven by the limitations in the range of five to 10 attributes already described. Further analysis of Figure 6.4 indicated that the gradient of the curve linking attributes #11 to #17 was distinctly different from the gradient of the curve linking attributes #18 up to the tail end of Figure 6.4. The grouping of attributes #11 to #17 was thus viewed as the attributes from the interview analysis to be considered as important but not essential.

It did not imply that all 10 attributes (#1 to #10) would be identified as essential for the sponsor to possess as only those attributes that were common to the top 10 of both Figures 6.3 and 6.4 were regarded as essential. Both figures indicated that the first 10 attributes (reading the attributes from top to bottom on the vertical axis) provided a practical limit determination. This was different from the top-eight practical limit that was determined for the survey questionnaire analysis in Chapter 5. The reason for the difference lies in the number of attributes that could practically be accommodated in the range of five to 10 attributes. For the survey questionnaire analysis, it was at eight attributes and for the interview analysis it was at 10 attributes. The rationale for the eight attributes for the survey questionnaire was explained in Chapter 5. For the interview analysis the selection of the top-10 attributes was explained as per the thinking process provided in Section 6.3.

From Figure 6.5 materialised the identification of those attributes that were common and not common between Figures 6.3 and 6.4. Figures 6.6, 6.7 and 6.8 then used the common essential attributes identified from the interview analysis (eight in total) for further analysis under the topics provided. This was a repeat as well as a comparison with what had been found in Chapter 5 under the same headings.

Eight attributes were common to both lists identified from the interview data analysis. Two attributes from each list were not common. The four attributes that were not common were:

- Ability to engage, demonstrated by taking personal ownership, showing commitment and loyalty, and acting in the long-term interest of the organisation;
- Experience in and knowledge of the industry domain of the project, from a technical, contractual and institutional perspective;
- Ability to use judgment and deal with compromises or trade-offs based on experience; and
- Understanding the role of the sponsor, its significance, and the need to align the project with the interests of the organisation.

The top-eight essential attributes required by a sponsor to enhance the probability of success of a megaproject as derived from the analysis of the interview data were:

1. Appropriately senior, accountable and empowered person with (personal and positional) power and credibility. Credibility understood in terms of being accepted by organisation and stakeholders as suitable for the role;
2. Understands the business, business case development, customer (market) or operations to enable informed decision-making;
3. Ability and willingness to provide objectivity to the project team and challenge the project assumptions for meaningful alternatives to maximise value in a complex or complicated environment;

4. Ability to provide clarity of direction (includes the ability to develop a compelling vision, understanding strategy of organisation, appreciating the linkage between the business or project objectives and the corporate strategy, and focus on results);
5. Ability to take holistic view (see the big picture), engage peers and take advice from others for key decisions;
6. Understands basic project management (can comment constructively at a high level on scope, risk, schedule, and cost management) and has project experience (preferably megaproject experience);
7. Ability to demonstrate high-level and diverse communication, including the ability to listen; and
8. Ability to select and keep the key players on the project team and assist the project manager to select and keep the right people at lower levels in the team.

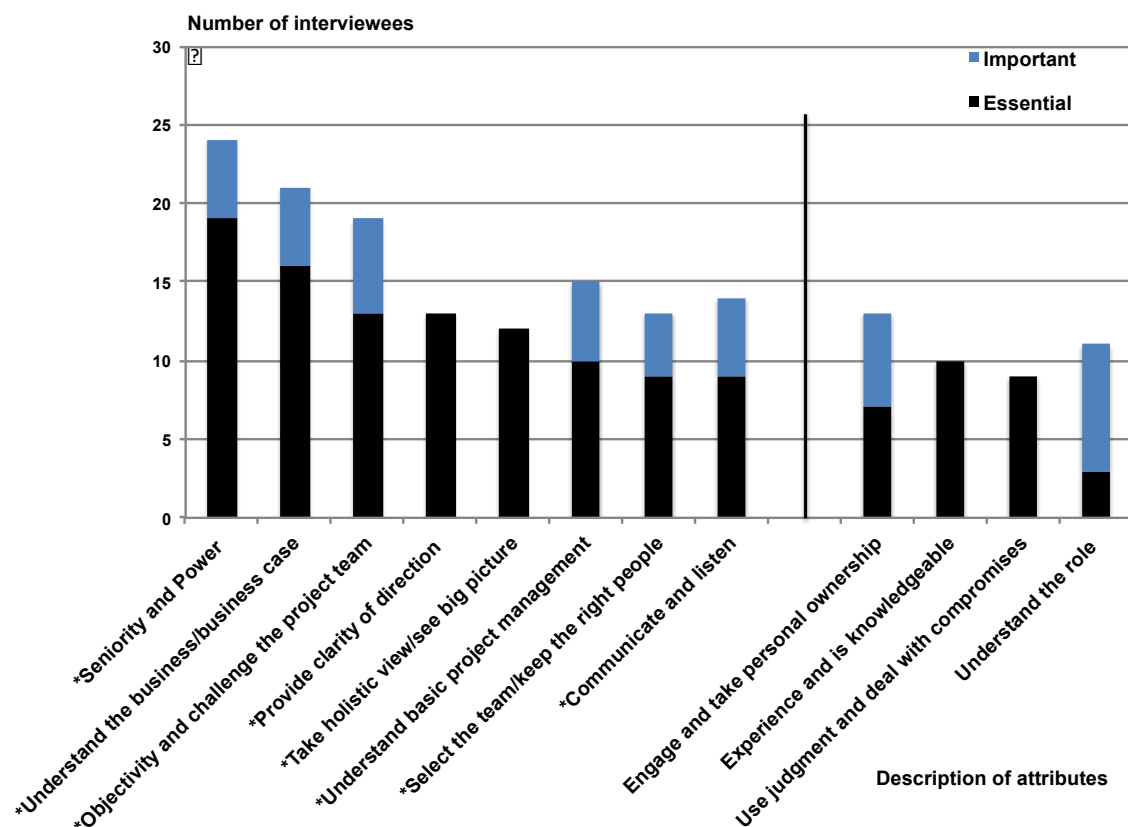


Figure 6.5: Top-eight common attributes identified after comparing essential and essential plus important attribute groupings

The following important but not essential attributes were identified as common to both Figures 6.3 and 6.4. To this list is added the four attributes not common to both figures for

the top-eight essential attributes determination. The number of interviewees who mentioned the attributes is indicated in brackets.

The list is as follows:

- Ability to engage, demonstrated by taking personal ownership, showing commitment and loyalty, and acting in the long-term interest of the organisation (13 interviewees);
- Understanding the role of the sponsor, its significance, and the need to align the project with the interests of the organisation (11);
- Experience in and knowledge of the industry domain of the project, from a technical, contractual and institutional perspective (10);
- Determination, ability to drive, tenacity, courage and resilience when conveying a sense of urgency and focusing on what matters most in leading for results and success (10);
- Ability to delegate authority to appropriate levels, support the delegation, provide ad-hoc support, keep project manager accountable and not micromanage (10);
- Ability to use judgment and deal with compromises or trade-offs based on experience (9);
- Ability to integrate, coordinate, organise or facilitate key issues on the project from a leadership perspective (8); and
- Knowledge of politics of organisation, being politically savvy or astute in politicised South Africa, particularly on public sector projects (8).

The above attributes are regarded as the important but not essential attributes emanating from the interview data.

The following three analyses allowed an additional insight into how perspectives of the interviewees regarding the top-eight essential attributes differed (or not). Providing these analyses enabled consistency of approach between Chapters 5 and 6.

The results for the respective breakdowns were as follows.

6.4.1 Public versus private sector projects

The distribution of the top-eight votes from the interviewees on private sector (N=15) compared to public sector (N=11) projects is indicated in Figure 6.6. The top-eight essential sponsor attributes from interviewees on private sector projects are indicated with the use of (a) and the public sector attributes with (b) along the horizontal axis in Figure 6.6. The black lines in Figure 6.6 connect the percentage of interviewees (as a percentage of the total number of interviewees) mentioning an essential attribute from the private sector (a's) to the public sector (b's).

From Figure 6.6 it was clear that:

- Understanding the business, business case development, operations and the market weighed much more for a sponsor in the private sector than for a sponsor in the public sector;
- The strong focus on understanding the business and business case development in the private sector was not surprising, given the profit motive that in essence drives behaviour in the private sector, as well as his/her ownership of the business case;

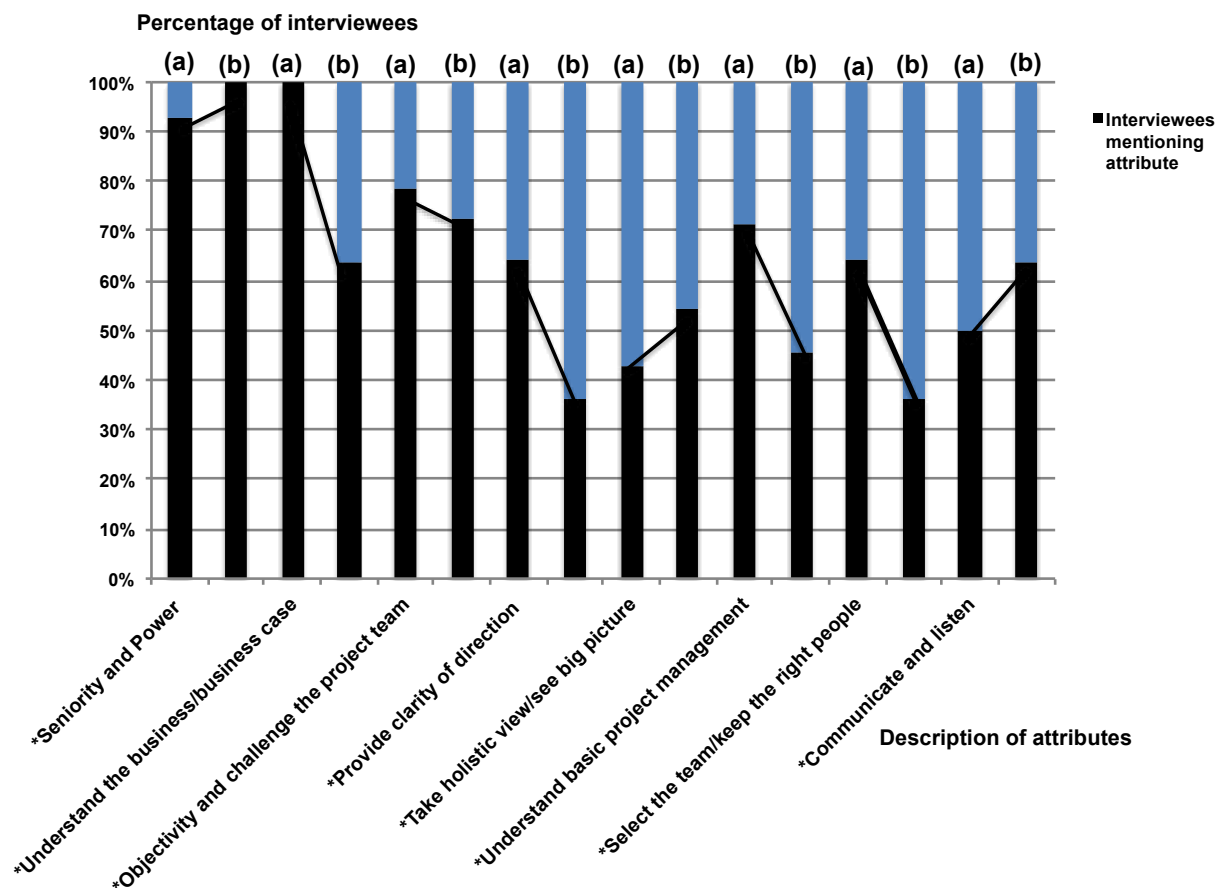


Figure 6.6: Top-eight attributes mentioned by interviewees from private (N=15) and public (N=11) sector projects

Format: Stacked 100%; (a) = private sector and (b) = public sector.

- The attributes 'ability to provide clarity and direction', 'understand basic project management' and 'select key individuals for the team' also rated higher in the private than in the public sector. Note should however be taken that the rating for the attribute 'ability to provide clarity of direction' was the opposite for the survey questionnaire, where the rating was higher in the public than in the private sector. Further work should

be done on why the contradictory views have resulted between the two methodologies, i.e., survey questionnaire and semi-structured interviews.

- The attributes 'ability to take a holistic view' and 'ability to communicate effectively and listen well' were in turn found to weigh much more for a sponsor in the public sector than for a sponsor in the private sector. The communication facet was not surprising, given that communication within and between organisational levels in the public service - with its distinct levels of bureaucracy - was very often a major cause of frustration. A sponsor with good communication skills, including the ability to listen, would therefore be a very valuable asset for a megaproject in the public sector.
- There was a smaller difference between the private and public sector interviewees for the attribute 'ability to take a holistic view' when compared to the outcome of the survey questionnaire for the same attribute. The gap between the private and public sector respondents in the survey questionnaire was double the gap for the semi-structured interviews. The reason for the smaller gap in the semi-structured interviews could potentially be found in the limitations placed on the survey questionnaires. These limitations referred to the request to the survey questionnaire respondents to vote for a limited number of important and essential attributes. Although the interview process included no such limitations, a number of interviewees struggled to reach the lower limits in the ranges 10 to 15 for the identification of important and five to 10 for essential attributes.
- In the survey questionnaire analysis the ability of the sponsor to be objective and to challenge the project team was perceived as essential by markedly fewer public sector survey questionnaire respondents than public sector interviewees as indicated in Figure 6.6. It can only be surmised that the issue of limitations imposed for the survey questionnaire resulted in this outcome, i.e., the interviewees did not have to hold back on mentioning an attribute during the interview.

Although not part of the identification of essential attributes, and perhaps surprisingly so, the interviewees from the public sector (particularly the sponsors) made a number of comments on the ability of the sponsor to deal with politics and the need for the sponsor to be politically savvy. This was specifically in relation to interfaces with national, provincial and local government (individuals and departments). The attribute 'knowledge of politics of the organisation, being politically savvy and astute in politicised South Africa, particularly on public sector projects' was an attribute that would always stand the sponsor in good stead.

6.4.2 Executive management versus sponsors versus project management

A comparison of the top-eight essential attributes between executive management, sponsors and project management is represented in Figure 6.7. For the purpose of this analysis, the input by the two supporting services participants within the national electricity utility were again, as in Chapter 5, considered part of executive management.

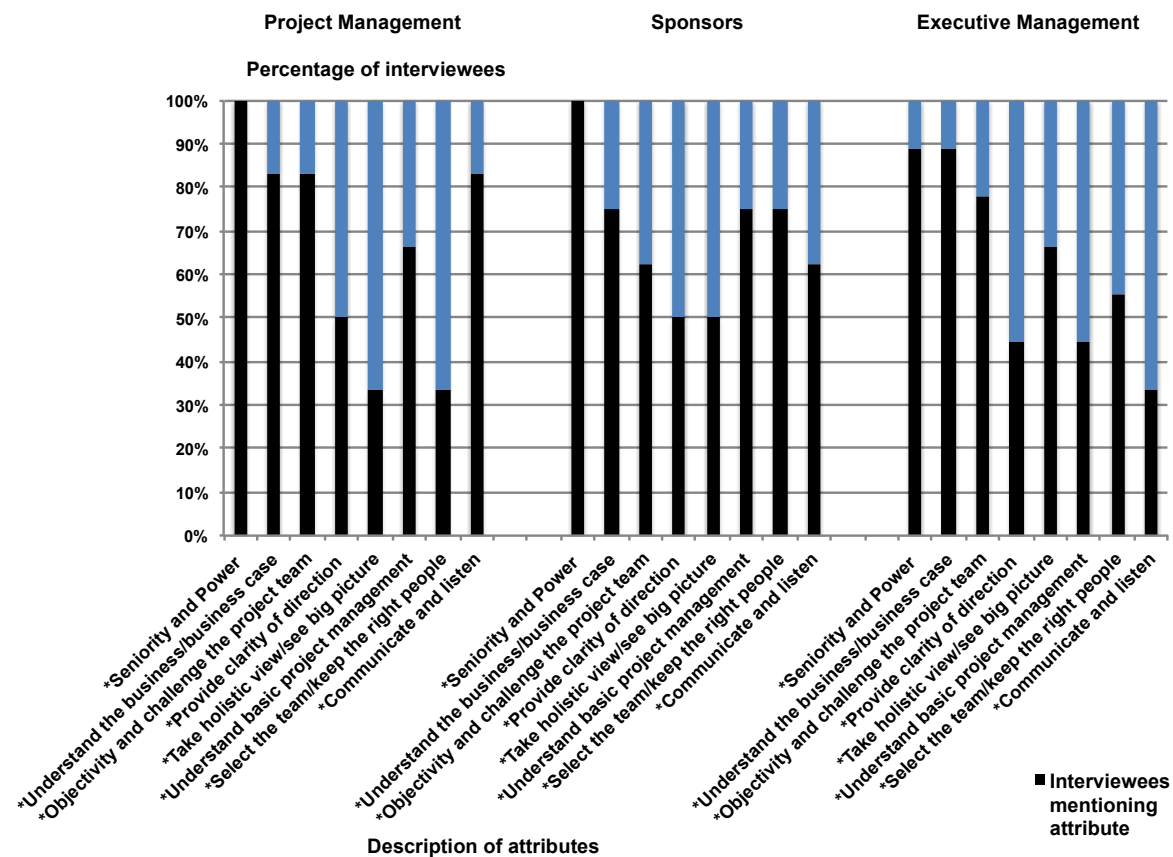


Figure 6.7: Top-eight attributes mentioned by project managers (N=6), sponsors (N=9) and executive managers (N=11)

Format: Stacked 100%

From Figure 6.7 the following can be deduced:

- All three organisational levels rated seniority and power as the most-mentioned essential attribute of the sponsor;
- As a collective, all three functionalities considered understanding of the business, business case, operations and the market as the second most-mentioned attribute to be possessed by the sponsor.
- The outcome of the survey questionnaire analysis was that both the executive managers and project managers out-voted the sponsors on the attribute 'ability to be objective and to challenge the project team'. In Chapter 5 it was reasoned that one of the

specific accountabilities of the sponsor, namely providing direction by ensuring alignment of the project with company strategy, played a distinct role in this assessment by the sponsors from a continuous validation perspective. From the interview analysis a much more balanced perspective on the essentiality of this attribute was provided. Both executive managers and project managers depended strongly on the sponsor to perform well in this regard. They could not afford a situation in which the sponsor's level of emphasis on the attribute as essential was at a distinctly lower level than their own emphasis.

- The project managers, for understandable and very valid reasons, regarded the sponsor's ability to communicate and listen well at all levels as a quite significant attribute to have. Reasons for the significance of the attribute lay in the flow of a wide spectrum of communication to and from the sponsor and the need for contextualisation of the communication by the sponsor for the project manager and the project team. The project managers rated this attribute, along with 'understanding the business and being able to provide objectivity to and challenge the team' as the second most-mentioned attribute for the sponsor to have.
- Different to the survey questionnaire analysis, executive managers and sponsors considered the ability to take a holistic view a highly mentioned essential attribute to possess, particularly so the executive managers. The project managers, as in the survey questionnaire, regarded the attribute as much less essential. In fact, the project managers deemed this attribute, along with the sponsor's ability to select key individuals for the team to be the least vital of the essential attributes.
- In deeming the attribute 'ability to select key individuals for the team' as one of the two least mentioned essential attributes, the project managers most likely were indicating a concern. Project managers were often fearful of others interfering in their projects and this might be an explanation for this assessment. A sponsor's selection of key individuals for the team was potentially one of those areas that, if not carefully managed and done in a mature fashion, could lead to friction between the sponsor and project manager. Executive managers held the same perspective as project managers of the attribute 'selection of key individuals for the team'. In turn, the sponsors considered this attribute an essential attribute to have, as reflected by its highly mentioned occurrence during the interviews with sponsors.

6.4.3 Successful versus failed projects

As indicated in Chapter 5, the executive managers, sponsors and project managers assessed the top-eight essential attributes as two separate collectives. A comparison was made of the inputs to the interview process by the participants on the successful projects,

and by the participants on the failed projects. This is represented in Figure 6.8. The successful projects (when measured with the criteria as per Merrow, 2011) as explained in Chapter 5 were the Gautrain rapid-rail link project and the Collieries replacement/ expansion programme. The other four projects were considered failed projects. The information in Figure 6.8 was obtained from nine interviewees from the successful projects and 17 from the failed projects.

For this analysis the input by the two senior managers from supporting services within the national electricity utility were again included.

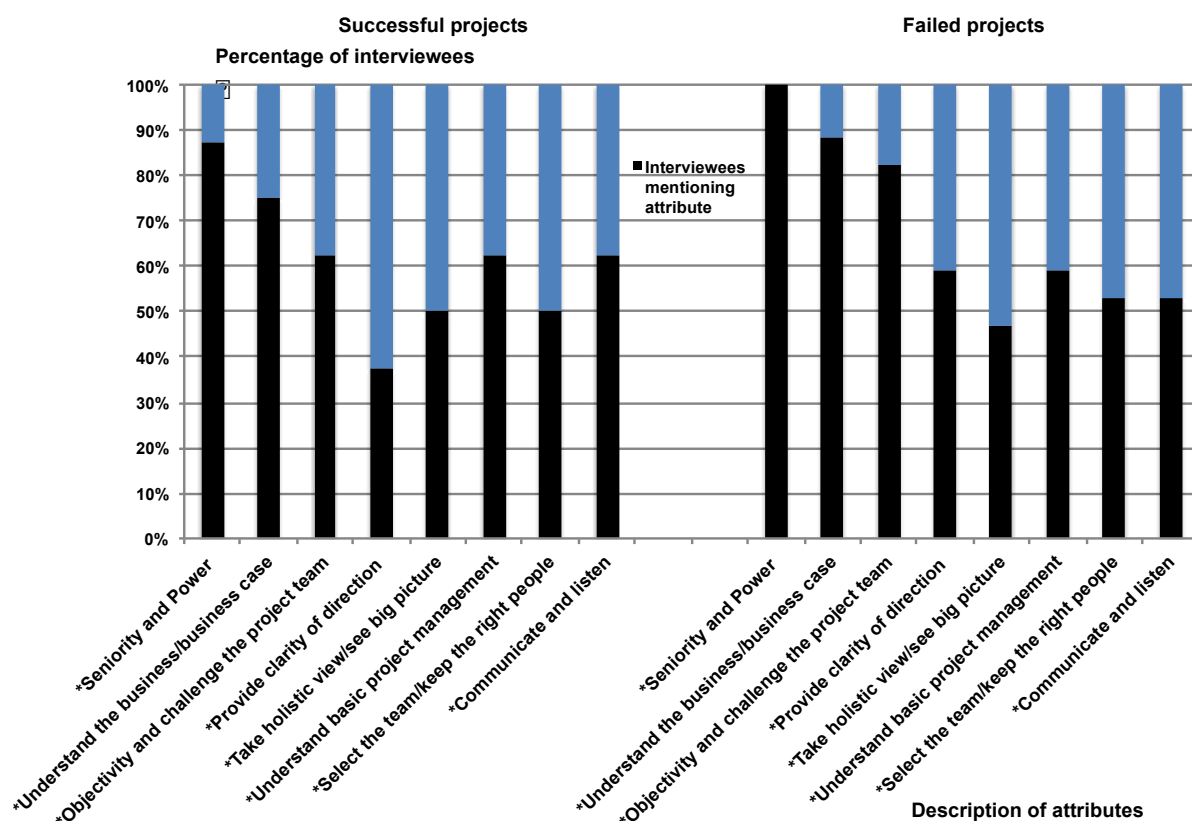


Figure 6.8: Top-eight attributes mentioned by interviewees from successful and failed projects

Format: Stacked 100%

From Figure 6.8 it can be deduced that:

- The interviewees from both the successful and the failed projects rated 'seniority and power' as the most-mentioned attribute;
- All the interviewees rated 'understanding of the business, business case development, operations and the market' as the second most-mentioned essential attribute. This was

not surprising as it pointed directly to an attribute that should be key in the profile of the sponsor, particularly as it concerned his/her ownership of the business case;

- The interviewees (from both successful and failed projects) indicated very similar ratings for the essentiality of the attributes 'ability to take a holistic view', 'understands basic project management' and 'ability to select key individuals for the team';
- It was interesting, yet somewhat surprising, to note the interviewees on the successful projects rated the attribute 'ability to provide clarity of direction' markedly fewer times as essential compared to the interviewees on the failed projects. A possible explanation for this result might lie in the fact that for a failed project there was often a significant need for the sponsor to enhance his/her ability to provide clarity of direction. At times when things were going badly and there were indications of project failure, the team had to be reminded constantly that there remained a bigger objective to be achieved and the overall direction had not changed. For successful projects this was not the case; and
- The previous point seemed to somewhat contradict that the interviewees on the successful projects indicated a greater perception of 'essentiality' for the attribute 'ability to communicate and listen' compared to those on the failed projects. The assumption was made that the ability to provide clarity of direction was typically mentioned in the same breath as the ability to communicate and listen. If so, then the expectation could have been that for a successful project sponsor both attributes would be regarded as essential but not so for a failed project sponsor. The interview analysis results, however, indicated differently.

6.5 DISCUSSION: COMPARISON BETWEEN ATLAS.TI RESULTS AND RESULTS FROM NUMERICAL ANALYSIS METHOD

6.5.1 Essential attributes

As indicated in Section 4.4.6.1, the survey questionnaires completed by the respondents were analysed through a bottom-up numerical methodology. This methodology counted the votes of the respondents per attribute listed in the questionnaire. The voting necessitated that the attribute (if voted for) be allocated to either an important or essential description as indicated by the respondent. Determining the top-eight essential attributes was assisted by plotting the results on a vertical bar diagram.

Having arrived at eight essential attributes that were common to both options ('essential only' and 'essential plus important') from the survey questionnaire analysis in Chapter 5 (Figure 5.3) and eight essential attributes that were common from both options for the interview analysis (Section 6.4), these two sets of essential attributes were then analysed for commonality of attributes.

The result was four common essential attributes as reflected in Table 6.2 (attributes #1 to #4) plus the motivation for two additional essential attributes (attributes #5 and #10 in Table 6.2). There were no other attributes in Table 6.2 that an additional motivation could or should be provided for.

Table 6.2: Comparison between survey questionnaire and interview data analyses for essential attributes

Essential attributes identified from survey questionnaire data analysis	Essential attributes identified from interview data analysis
1. Appropriate seniority, credibility and (personal and positional) power within the organisation. Credibility understood in terms of being accepted by the organisation and stakeholders as suitable for the role.	1. Appropriate senior, empowered and accountable person with (personal and positional) power and credibility. Credibility understood in terms of being accepted by the organisation and stakeholders as suitable for the role.
2. Ability to provide clarity of direction (including the development of a compelling vision) within the context of the strategy and governance arrangements of the organisation.	2. Ability to provide clarity of direction (includes the ability to develop a compelling vision, understanding strategy of the organisation, appreciating the linkage between the business or project objectives and the corporate strategy, and focus on results).
3. Ability and willingness to provide objectivity to the project team and challenge the project assumptions.	3. Ability and willingness to provide objectivity to the project team and challenge the project assumptions for meaningful alternatives to maximise value in a complex or complicated environment.
4. Ability to take a holistic view (see the big picture), and engage peers in the organisation for advice and support for key decisions.	4. Ability to take a holistic view (see the big picture), engage peers and take advice from others for key decisions.
5. Ability to engage by being willing to take personal ownership and act in the long-term interest of the organisation (demonstrating loyalty, motivation and commitment).	
6. Good negotiation skills, particularly in the context of securing the availability of resources (financial, people or other) for the project manager.	
7. The competence (i.e., the combination of knowledge, personal attitude and skills) to fulfil the role.	
8. Interpersonal and critical thinking skills, including the ability to work with and handle ambiguity.	
	9. Understands the business, business case development, customer (market) or operations to enable informed decision-making.
	10. Understands basic project management (can comment constructively at a high level on scope, risk, schedule, and cost management) and has project experience (preferably megaproject experience).

Essential attributes identified from survey questionnaire data analysis	Essential attributes identified from interview data analysis
	11. Ability to select and keep the key players on the project team and assist the project manager to select and keep the right people at lower levels in the team.
	12. Ability to demonstrate high-level and diverse communication skills, including the ability to listen.

It is evident from Table 6.2 that there are four attributes that are common to both methods of analysis and eight attributes that belong to only one of the methodologies. This provided a solid basis for continuing the search for attributes in addition to the four common attributes identified in Table 6.2 to be included in the overall spectrum of attribute essentiality. Additionally, the researcher continuously kept in mind the limitation (or rather, range) of five to 10 such attributes that a sponsor should reasonably be expected to possess in the context of megaprojects. As mentioned in Chapter 5, seven is the practical number. However, the researcher contends that it is not an absolute number and can be stretched, particularly given that an individual who is not just an average person needs to be appointed as sponsor for a megaproject. So should the key members of a megaproject team also not be just a collection of 'average' individuals.

Earlier discussion on why the collapsing of the two attributes dealing with understanding the business and understanding business case development did not provide a compelling argument for why such an attribute should be placed in the essential attributes listing emanating from both methodologies.

A case could, however, be made for challenging the range of five to 10, to increase the practical limit for the survey questionnaire analysis to nine attributes. If this was done then the attribute 'understanding of basic project management concepts and understands and can comment constructively at a high level on scope, risk, schedule, and cost management' became part of the essential attributes (as per Figure 5.3 in Chapter 5). The same attribute was already part of the essential attributes emanating from the interview analysis (#10 in Table 6.2). This reasoning provided a reasonable basis for five common essential attributes to be present in the profile of a megaproject sponsor.

The attribute 'ability to engage, demonstrated by taking personal ownership and act in the long-term interest of the organisation' was one of the top-eight essential attributes as indicated by the survey questionnaire analysis and depicted in Figure 5.3 in Chapter 5. The same attribute was also the most mentioned attribute in the important but not essential category from the interview analysis. It was clearly the most balanced of the important but

not essential attributes in terms of the split between interviewees mentioning it as important or essential, as is indicated in Figure 6.5. Thirteen interviewees mentioned the attribute during their interviews. Seven of these interviewees considered it an essential attribute and six considered it an important attribute. It missed, by a small margin being regarded as essential when the common attributes were determined. The researcher contends that the explanation provided supported a motivation to include this attribute in the essential listing of attributes as the sixth essential attribute for a sponsor to possess.

Reasoning has already been provided for the attribute 'understands basic project management' to be included as the fifth essential attribute for a sponsor to possess.

From Table 6.2 and the motivations provided above, the researcher finds that the following attributes should be considered the essential attributes for the sponsor to possess. There was sufficient common ground in the outcomes of the two methods of analysis that six attributes could be listed as essential attributes. The researcher contends that six essential attributes are sufficient and believes that the 'practical' number of seven attributes is to be used as a guideline depending on the circumstances of the research.

The six essential attributes are:

1. Appropriately senior, accountable and empowered person with (personal and positional) power and credibility. Credibility understood in terms of being accepted by organisation and stakeholders as suitable for the role;
2. Ability and willingness to provide objectivity to the project team and challenge the project assumptions for meaningful alternatives to maximise value in a complex or complicated environment;
 'I've always been challenging the guys and ask them: "Are there better ways of doing things? Have we really thought of everything?"' (sponsor)
3. Ability to provide clarity of direction (includes the ability to develop a compelling vision, understanding strategy of organisation, appreciating the linkage between the business and project objectives and the corporate strategy, and focus on results);
 'In my mind he should be able to drive strategy. For that matter he must, being a strategist, also understand the business that he is in and what are the real critical success factors.' (project manager)
4. Ability to take holistic view (see the big picture), engage peers and take advice from others for key decisions;
 'I think the big one for me is you need a big-picture attitude because if there is one person [the sponsor] in the entire environment on a megaproject, it is a person who has that "big, big picture" of all the important aspects whether

it is the market, the resources, the feed stocks, the customers, the regulatory environment, the legal environment, the country environment, also if it goes cross-country and so on.’ (sponsor)

5. Understands basic project management (can comment constructively at a high level on scope, risk, schedule, and cost management) and has project (preferably megaproject) experience); and

‘So, it’s in [front-end] business now, but it’s also [in] some [front-end] technical now. [Front-end] technical now is not only about the process but also about project management, about let’s say all the other technicalities of a project and some of them you might not be totally clued up with. At least you must have some background that you can sort of pick up those issues.’ (executive manager)

6. Ability to engage, demonstrated by taking personal ownership, showing commitment and loyalty, and acting in the long-term interest of the organisation.

‘Leadership capability, and then also very important I think is “commitment” to the project. The sponsor actually needs to “believe” that the project should be done.’ (executive manager)

6.5.2 Important but not essential attributes

In order to evaluate the extent to which the important but not essential attributes from the survey questionnaire analysis matches the important but not essential attributes identified from the interview analysis, Table 6.3 is provided. Included in Table 6.3 are those attributes that missed the cut-off for being deemed essential and for which no additional motivation is provided to retain them in the essential attribute category for both methods of analysis.

**Table 6.3: Important but not essential attributes
from survey questionnaire analysis compared to interview analysis**

Important but not essential attributes identified from the survey questionnaire data analysis (number of votes in brackets)	Important but not essential attributes identified from the interview data analysis (number of interviewees mentioning attribute in brackets)
Good negotiation skills, particularly in the context of securing the availability of resources (financial, people or other) for the project manager (20).	
The competence (i.e., the combination of knowledge, personal attitude and skills) to fulfil the role (22).	
Interpersonal and critical thinking skills, including the ability to work with and handle ambiguity (21).	
Understanding of business case development and seeks input on content with executives in organisation (19).	Understands the business, business case development, customer (market) or operations to enable informed decision-making (21).

Important but not essential attributes identified from the survey questionnaire data analysis (number of votes in brackets)	Important but not essential attributes identified from the interview data analysis (number of interviewees mentioning attribute in brackets)
	Ability to select and keep the key players on the project team and assist the project manager to select and keep the right people at lower levels in the team (13).
	Ability to demonstrate high-level and diverse communication skills, including the ability to listen (14). Note: This attribute clearly indicated as an essential attribute by the interviewees.
	Experience in and knowledge of the industry domain of the project, from a technical, contractual and institutional perspective (10). Note: Interviewees regarded the attribute as either essential or one of the more important attributes.
	Ability to use judgment and deal with compromises or trade-offs based on experience (9). Note: Interviewees considered this attribute a very strong 'important' attribute. This is particularly so from the context of arriving at compromises in an environment that is complex or complicated by nature.
	Understanding the role of the sponsor (11).
Political knowledge of the organisation and being politically savvy (18).	Knowledge of politics of organisation, being politically savvy and astute in politicised South Africa, particularly on public sector projects (9).
	Ability to delegate authority to appropriate levels, support the delegation, provide ad-hoc support and keep project manager accountable (10).
	Ability to integrate, coordinate, organise or facilitate key issues on the project from a leadership perspective (9).
	Determination, ability to drive, tenacity, courage and resilience when conveying a sense of urgency and focusing on what matters most in leading for results and success (10).
Continuity of the sponsor on the project throughout the lifecycle of the project (18).	
Ability to act swiftly and decisively and take responsibility for decisions (18).	
Ability to foster an atmosphere of openness and trust (19).	

The following attributes should feature prominently on a list of important but not essential attributes for the sponsor to possess. Some of the attributes listed could in fact be regarded as borderline *essential* attributes. Such a list would be of distinct assistance or advantage for executive management during the assessment of candidates for the sponsor role. These important but not essential attributes are:

- Knowledge of the politics of the organisation, being politically savvy and astute in politicised South Africa, particularly on public sector projects.

The context of a public sector megaproject and the very pertinent need to be politically aware is highlighted in the following two quotations.

‘But I just felt that somewhere, you know, the complexities of the relationships between our politics and things like that within the context of a public megaproject, I think, is phenomenal, which if the guy is not capable of handling that and understanding that, then he will never make it.’
(sponsor)

‘... but as I’ve already said, if it’s a government project you must understand the politics and you must understand the funding.’ (project manager)

This attribute was one of two attributes common to both methods of analysis as can be seen from Table 6.3. Additionally, it also appeared firmly in the list of attributes considered for the determination of important but not essential attributes.

- Understands the business, business case development, customer (market) and operations to enable informed decision-making. If not the full attribute then as a minimum the business case component thereof;

This was the other common attribute of both methodologies, as is reflected in Table 6.3. In the interview analysis it garnered the second highest number of mentions (21) by interviewees and missed the cut-off to be considered an essential attribute by a small margin. For the survey analysis it featured strongly in the list of attributes to be considered important but not essential with 19 votes allocated to the attribute. It was clearly on the border of being allocated essential attribute status.

- Experience in and knowledge of the industry domain of the project, from a technical, contractual and institutional perspective.

The breadth of understanding and experience that a sponsor should have of the type of industry that a megaproject pertained to was quite vividly sketched by the following quotation.

‘The person must understand the background of the engineering function, for example, it is nuclear, [it is] not coal. It’s a big difference. And then [at] a high level, the person must understand something like “generation”. It is important that you’ve got that. And then what you’ve added of the basics of project management, etc.’ (sponsor)

This attribute just missed being part of the essential attributes from the interview analysis and it did so even after being mentioned 'essential' only by the interviewees (10). Nearly all the other attributes competing for essential attribute status in the interview analysis did so with the assistance of interviewees who did not consider them as essential but as important. Unfortunately, this attribute was not identified as an attribute for the survey questionnaire. This did, however, not prevent the researcher from recognising it as an additional attribute raised by the interviewees for consideration and inclusion as an important but not essential attribute for a sponsor to possess.

- Ability to select and keep the key players on the project team and assist the project manager to select and keep the right people at lower levels in the team.

The need for an inclination by the sponsor to support the project manager when it came to selection and keeping of key personnel on the project team was made very clear in the following quotation.

'And, actually, when we come to the attributes later on, I would actually say that [the sponsor] was able to understand whom to appoint. Also the fact that we, (and) as I have mentioned that the international connection was very important (for international companies) to come to South Africa and invest here in time and money. So, it was not only choosing the South African companies but also those [international] companies. Now I think the important thing was also that there was a relationship of trust between [the sponsor] and myself, and he was willing to delegate, which is very important in a megaproject. If you try to micromanage as a sponsor, everything is not going to work. (project manager)

The interview analysis indicated that 13 interviewees mentioned the attribute. That resulted in it being listed as an essential attribute from the interview analysis. It also did not appear as a standalone attribute in the survey questionnaire.

If the same logic is applied as for the attribute of experience and knowledge of the industry domain of the project, then the attribute 'ability to select and keep the key players on the project team' is also an important but not essential attribute.

- The competence (i.e., the combination of knowledge, personal attitude and skills) to fulfil the role.

From the survey questionnaire analysis this attribute garnered the third highest number of votes (22). However, only five interviewees mentioned it for the interview analysis. In the detail of this attribute can be included a number of the dimensions that were not common to both methodologies in the important but not essential spectrum.

On this basis the researcher also included those attributes that were not part of the survey questionnaire but were presented as important but not essential attributes in the interview analysis in Table 6.3. The competency list, therefore, *inter alia* included judgment, tenacity, determination, ability to integrate or coordinate, fostering of trust, understanding the role, business, commercial and financial acumen and ability to make decisions and hold others accountable. Further work was required to determine the exact compilation of important but not essential attributes to be included in the competence attribute.

The reason for not including the other attributes in Table 6.3 with high votes garnered from the survey questionnaire analysis or high number of interviewees mentioning it from the interview analysis was that essentially in all the cases when the one score (e.g. survey questionnaire analysis) was high, the other score (e.g. interview analysis) was low.

An example is the attribute 'interpersonal and critical thinking skills, including the ability to work with and handle ambiguity'. From the survey analysis it garnered a high number of votes (21) but from the interview analysis it was mentioned by only a small number of interviewees (three). The same explanation held for the attribute 'good negotiation skills, particularly in the context of securing the availability of resources (financial, people or other) for the project manager'. It garnered 20 votes from the survey analysis but only two mentions from the interview analysis.

The opposite materialised for the attribute 'ability to demonstrate high-level and diverse communication skills, including the ability to listen'. It was mentioned by 14 interviewees in the interview analysis (relatively high on the interview scale) and garnered 15 votes from the survey questionnaire analysis that was mid-range of those attributes that were at the lower end of the survey questionnaire analysis scale.

In summary, the resultant output of a process that merged the outputs of a survey questionnaire analysis and an interview analysis was a configuration that contained six essential and five clearly important but not essential attributes.

6.5.3 Interview responses not specifically related to differentiation between important and essential interview questions

As part of the interview process, a number of other questions were asked at the respective levels, i.e., executive manager, sponsor and project manager. The questions were structured to determine the following:

- Identification, appointment and practices followed, e.g. tests used and factors considered prior to appointment of the sponsor on the project;
- Active participation of the sponsor on the project and the level of participation of the sponsor on the project is important; and

- Success or failure of the project utilising the following thresholds for failure:
 - Cost overrun > 25%;
 - Slip in execution schedule > 25%; and
 - Production versus plan i.e., significantly reduced production into year 2.

The questions were not analysed with the assistance of ATLAS.ti as that was never the intent. The common threads that crystallised for each of the questions are as follows.

6.5.3.1 Practices followed

Formal practices were not followed for the identification of any of the sponsors participating in the research, and no psychometric or other tests were utilised to determine the suitability of the individuals for the role. At best the appointments of the sponsors were recorded during project steering committee meetings as a formal verification of the appointment action. The following quotation provided a clear indication of the lack of consideration to formalising the evaluation of the sponsor prior to his/her appointment on the project.

‘No, I think it was mostly because I had success in many of the areas that make up a megaproject management sort of thing, *ja* [yes]. But no, there was no formal evaluation.’ (sponsor)

6.5.3.2 Active participation

Active participation by the sponsors was confirmed on all the case study projects. In one case the sponsor was considered to be perhaps too involved to his own detriment. In another case the sponsor reflected that active participation varied from person to person depending on what stage of the lifecycle the project was in. As was mentioned in the following quotation the risk clearly existed that the sponsor might not be effective in the role because of over-active involvement in the detail of the project.

‘I think he participated very actively, probably too actively, and I think he in the process perhaps got too close to the detail and did not play his sponsor role. In my book the sponsor is not a super project manager.’ (executive manager)

A very valid contribution, as was reflected in the following quotation was made by a sponsor in commenting on the variation of involvement by the sponsor during the different phases of the project.

‘Quite active. I think to me the participation varies through the lifecycle of the project, but *ja* [yes], I think it was – you have to be part of the project. I mean you can’t stand on your own, [in some situations] you have to be 24/7, 365 on one project. Again, I think it varies from individual to individual.

I think some people would prefer that kind of way of work. I wasn't, that's not how I did it.' (sponsor)

In terms of the level of participation of the sponsor on the project it was best summarised by the following quotation stressing the requirement for full involvement on the project:

'It is crucial, you know, it goes on the assumption that if it is a megaproject, it is billions of Rands, it involves thousands of people that could make or break organisations. So, you had better be fully involved.' (sponsor)

6.5.3.3 Success or failure

From a project success perspective four of the six megaprojects exceeded the thresholds for failure. It should be noted that for one of the failures the owner of the project did not agree that the project was a failure, even though it had not met the thresholds for both cost and schedule. The owner argued that all the increases in costs and slippages in schedule had been approved by the board of the organisation and that this nullified the measures used. This was argued despite the measures being used on a global basis (Morrow, 2011).

6.5.4 Additional perspectives on triangulation

To provide additional context to the discussion and findings above, it was considered necessary to elaborate on what was established in Section 4.4.6.1 regarding data triangulation. Transparency and data saturation had been achieved and a relationship existed between data saturation and data triangulation.

Triangulation (one of a larger set of validation strategies) was often used in qualitative research where typically a process was followed that confirmed evidence from varying sources to clarify a theme or a perspective (Creswell, 2013). In the same context, Jack and Raturi (2006, p. 345) commented that the purpose of triangulation was generally to confirm findings '...through convergence of different perspectives. This convergence of perspectives is viewed as representing reality.'

Patton in Yin (2014, p. 120) indicated four types of triangulation:

- Data triangulation (of data sources);
- Investigator triangulation (different evaluators);
- Theory triangulation (perspectives of the same data set); and
- Methodological triangulation (different methods, within method and between methods).

Jack and Raturi (2006) referred to the same four types of triangulation as Patton, but added a fifth one:

- 'Multiple' triangulation (multiple observers, theoretical perspectives, sources of data and methodologies in one investigation).

For this research three types of triangulation were relevant, i.e., data triangulation (survey questionnaires and semi-structured interviews), theory triangulation (perspectives of the same data set, i.e., essential and essential plus important attributes) and methodological triangulation (bottom-up numeric and CAQDAS analysis).

Mathison (1988) stated that three outcomes might result from a triangulation strategy:

- Convergence: This was when data from different sources, methods and investigators provided evidence that resulted in a single proposition about some social manifestation, e.g. the attributes of the megaproject sponsor;
- Inconsistency amongst the data: This was when multiple sources or methods were used and a range of perspectives or data materialised that did not confirm a single proposition about the attributes of the megaproject sponsor. Alternative propositions on the attributes might be presented containing inconsistencies and ambiguities; and
- Contradiction: Data could be both inconsistent and contradictory. For the research the use of several methods ended in results that supported a limited number of views representing differences in importance of the attributes of the megaproject sponsor.

Mathison (1988, p. 17) also stated that the occurrence of data resulting in a single proposition when exploring a social phenomenon was not readily achievable. Data occasionally converged and regularly resulted in inconsistencies and potentially also contradictions. When this happened, logic had to be derived from what was found. Embedding the empirical data available with an overall understanding of the specifics of the situation was then required. Mathison (1988) concluded that triangulation had been refocused from being a technological solution for ensuring validity to placing the responsibility with the researcher for the development of credible explanations about the social phenomenon being explored.

Triangulation for the research did not result in a single proposition about the essential attributes of the megaproject sponsor. Essentially this meant that the three perspectives for essential attributes arrived at with the methodologies applied (literature, survey questionnaire and interviews) did not produce identical results from the different methodologies. In addition, ranking the essential attributes identified through the two methodologies and producing exactly the same order was not considered an objective to be achieved.

The convergent findings for the essential attributes reflected that six out of nine attributes for both methods of analysis presented an outcome that was nearing a single proposition. This was a firm indication of similarity and confirmed that there was validity in the results.

Similarly, for the important but not essential attributes a single proposition of attributes was also not achieved. The convergent findings presented a proposition that was not as aligned as the essential attributes. The outcome, after combining, collapsing and moving to the essential attributes category took place, was that three out of seven important but not essential attributes converged for both methods of analysis.

As has been explained, convergence of the attributes in a single proposition had an unlikely probability of materialising and was not to be expected. Deriving logic from the data and maximising the overlap mentioned was potentially the greater objective to be achieved (Mathison, 1988). Plausible and logical reasoning for the inconsistent findings for both the important and essential attribute categories has been provided.

This implied that an initial list of 32 attributes had been refined to the critical few that a sponsor on a megaproject needed to possess. The six essential attributes identified were within the range of five to 10 and close to the practical number of seven attributes. The clarification for the use of the description 'practical' as a substitute for 'average' as well as the range in the research was provided in Section 4.4.5.5.

Given that there were no additional attributes that deserved to be identified as essential, the six attributes identified sufficed. Ensuring that a sponsor possessed or had a command of these attributes would make a distinct contribution to improving the probability of success of the megaproject.

6.6 DISCUSSION: RESEARCH QUESTIONS AND AIM

The research aim is to identify the important and essential attributes of a sponsor on a megaproject. To achieve this aim it was necessary to answer a number of research questions. Similar to Chapter 5, the responses from the interviewees during the interviews and the link between these responses and the research questions are reflected upon as follows:

6.6.1 Research question 1: How is the potential megaproject sponsor identified and appointed and what are the attributes that he/she should possess?

The question was based on the proposition that sponsors needed to be identified and appointed from executive/ senior management for megaprojects informed by the attributes they possessed.

It was confirmed that no formal assessment process was used to identify or select any of the sponsors. The sponsors of all six projects were from the executive management ranks of their organisations. The sponsor was either the originator, the developer or owner of the

business case in all six cases. In none of the six cases were the required attributes to perform the role formally considered prior to sponsors' appointment. It was accordingly not possible to successfully determine the 'how' part of the research question. The attributes a sponsor should possess became clearer as the results of the interviews were analysed. The results provided insight on the required sponsor attributes.

6.6.2 Research question 2: How do professionals in the field rank the relative importance of the attributes of megaproject sponsors (assuming not all the attributes are equally important)?

The question was based on the proposition that all the attributes of a sponsor on a megaproject were not equally important when measured relative to each other.

The extensive managerial experience of the interviewees enabled them to rank the relative importance of the attributes with ease. The interviewees primarily made use of their prior experience to differentiate between important and essential attributes of a sponsor. By plotting the individual responses received from the interviewees, relative ranking of the attributes was determined for both important and essential attributes.

6.6.3 Research question 3: Why are certain attributes of the sponsor on a megaproject defined as important?

The question was based on the proposition that certain attributes of the sponsor on a megaproject were defined as important to be possessed i.e., critical for the sponsor to be effective in the role.

As explained in Section 5.5.3, it was notable from the interviews that some of the interviewees initially experienced it challenging to identify those attributes that required serious attention when compared to others in the overall list of attributes identified from literature. Improvement in their understanding of the difference was assisted by the clarification provided by the researcher before, during and after the interview, explaining that not all of a significant number of attributes identified in literature can normally be accommodated in the persona of one individual. Use was made of the definition (from Merriam-Webster, n.d., provided in Section 6.4.1) to explain that important attributes were those attributes that had serious meaning or worth for the sponsor and required serious attention. When the interviewees were requested to indicate which attributes they considered as important, they were comfortable that the definition provided the necessary assistance.

At the end of the interview it was also explained to the interviewees that the process of identifying essential sponsor attributes commenced with their identification of those attributes that they considered important for the sponsor to possess.

6.6.4 Research question 4: Which important attributes of a sponsor on a megaproject are considered as essential for the project to be a success?

The question was based on the proposition that certain important attributes of the sponsor on a megaproject were considered as essential i.e., if not possessed by the sponsor it could lead to project failure. Alternatively stated it meant that these attributes were 'so important as to be indispensable' (Merriam-Webster, n.d.).

It was explained to the interviewees that once having identified the important sponsor attributes, they were required to identify the essential attributes of a sponsor. The explanation included creating an understanding that some important attributes were more important than others and that these attributes were considered essential. Using Merriam-Webster (n.d.) again, the researcher explained to the interviewees that 'essential' meant the attributes were so important that they were considered as indispensable for the sponsor to have. Additionally, it was conveyed to the interviewees that 'essential' was a higher order of 'importance' and had accordingly been coupled directly with the success of the project. This implied that to improve the probability of success of the project, the sponsor required a number of essential attributes. It also implied that all essential attributes were important, but all attributes categorised as important were not necessarily essential.

When the interviewees were requested to indicate from the important attributes they had identified during the interview those they considered as essential, they quite comfortably referred to the definition of 'essential' as part of their explanation.

Figures 6.3, 6.4 and 6.5 assisted in answering the research question of why certain attributes were defined as important, and which important attributes were considered essential. Comparing Figures 6.3 and 6.4, and identifying attributes common to both figures, assisted in identifying those attributes that were considered more important than others. This comparison, reflected in Figure 6.5, portrayed the more important, i.e., essential attributes.

Attempting to identify a large number of essential sponsor attributes was not practical. Only a limited number of attributes were required to be effective in the role (APM, 2018). As indicated in Table 4.6, it can be deduced from literature that there was a range of five to 10 attributes that a 'normal' individual could possess and the average of seven appeared to be a practical number.

6.6.5 Research question 5: Which psychometric and other tests can reliably assess important attributes of a potential megaproject sponsor?

The question was based on the proposition that the determination of which attributes a potential sponsor on a megaproject possessed could be performed with a full array of psychometric and other tests.

In none of the interviews was it found that psychometric or other tests had been used to assess the attributes of a potential sponsor. Chapter 3 suggests a framework for the application of certain psychometric and other tests to determine:

- The leadership style of the potential sponsor; and
- The important attributes of a candidate for the role.

6.6.6 Research question 6: What should the level of active participation of a megaproject sponsor ideally be in order to make a decisive impact on the success of the project?

The question was based on the proposition that an active megaproject sponsor during the lifecycle of the project made an essential contribution to project success.

In none of the interviews was it found that the sponsor encroached on the role and responsibilities of the project manager. According to the project managers, active and positive participation of sponsors was considered to be:

- A focus on governance;
- Consistently ensuring that the project supported the business case; and
- Stakeholder management.

Active participation in stakeholder management was emphasised by project managers, especially the 'ability to negotiate' attribute. The project managers found that for matters outside their control that required negotiation, a sponsor with this attribute was particularly valuable. Executive managers considered 'active participation' as knowing what was happening on the project through frequent contact with the project team, often shortly before reporting to a steering committee or board.

'Continuity' was important but it was not considered essential. It should be kept in mind that a megaproject typically has a total lifecycle in excess of 10 years. For an individual with high potential and in the early stages of his/her executive management career, such a period is inordinately long to spend in one position. An older executive, heading towards retirement, might not be a sustainable incumbent for the full project lifecycle. It might be wise for one individual to act as sponsor for the front-end and another for the execution phase of the project.

6.7 COMPARISON OF COMBINED RESULTS WITH THE APM (2018)

A comparison between the combined outcomes of the research (as in Section 6.4) and the publication that possibly provided the most comprehensive guidance on the identification of sponsor attributes and sponsor selection allowed the following to be deduced. The literature referred to is the APM (2018). There is no difference between the APM (2009) and APM

(2018) revisions as far as it pertains to the five personal attributes that the board or executive management should consider when selecting a sponsor.

Although the APM (2018) stated that it was a guide for providing support to sponsors for the full spectrum of project size, it had certainly been influenced by the underperformance and failures of certain major projects. It had also been found to be the publication in literature that provided the best guidelines on sponsor selection and appointment. Not only did it provide a clear checklist for choosing a sponsor, it also recommended and provided guidance on the contents of letters of appointment (also referred to as briefs) for sponsors. Such briefs contained *inter alia* the accountability of the sponsor for the project, the timing of becoming accountable and the duration of the role linked to specific milestones.

The five personal attributes that the board of an organisation should consider when selecting a sponsor were as follows (APM, 2009, 2018):

- Understanding;
- Competence;
- Credibility;
- Commitment; and
- Engagement.

A mapping of the combined outcome of the analyses performed with both methods of analysis with an expanded list of the five APM attributes is portrayed in Table 6.4.

Table 6.4: Comparison between attributes identified from literature and this research

APM (2009, 2018) attributes	Important and essential attributes identified from this research (both methods of analysis)
	Appropriate seniority, credibility and (personal and positional) power within the organisation. (E)
Understanding (U) Understands the organisation's governance arrangements Understands the project context	
Understands the sponsorship role (U)	Understands the role (C)
Appreciates how the project contributes to the corporate strategy (U) Identifies and focuses on what matters most (U)	Ability to understand strategy, link business and project objectives and provide focus (C)
Provides clarity of direction (C)	Ability to provide clarity of direction (including developing a compelling vision) (E)
	Ability to provide objectivity to and challenge project team (E)
	Ability to take a holistic view (see the big picture) (E)

APM (2009, 2018) attributes	Important and essential attributes identified from this research (both methods of analysis)
	Ability to demonstrate high-level and diverse communication skills, including ability to listen (I)
	Understanding the needs of the business, business case and customer (I)
Value management (C)	Possesses business, financial and commercial acumen (C)
Competence (C) Manages people and other resources effectively Motivates people Negotiates effectively Self-aware about strengths and weaknesses Commercial awareness of risk Strategic risk management	Understanding of and possessing the competence for the role, e.g. ability to integrate and coordinate Possesses political astuteness Possesses tenacity and determination Ability to foster trust Ability to learn and adopt
Makes effective decisions and takes decisive action when necessary (C)	Ability to make decisions and hold people accountable (C)
Has a good understanding of project management (C)	Understands basic project management (can comment constructively at a high level) and has project experience (E)
Has relevant experience (C) Has sufficient appreciation of the project's technical requirements (C) Demonstrates good judgement (C)	Possesses experience and knowledge of industry domain of project (technical, contractual and institutional) (I) Ability to use judgment (C)
Credibility Respected by major stakeholders Ability to influence internal and external stakeholders Evident track record Motivated to act in the long-term interest of the organisation	Credibility understood in terms of being accepted by organisation and stakeholders as suitable for role (E)
Commitment Has time to commit to project outcomes, short- and long-term	
Engagement Has other responsibilities within the organisation that gives insight into its dynamics Aligns the project with the interests of the organisation Obtains regular updates on the organisation's strategy	Ability to engage, take personal ownership, show commitment and loyalty, and acting in long-term interest of organisation (E)

Table endnote: (U) = understanding, (C) = competence, (E) = essential, (I) = important

From Table 6.4 the following can be deduced:

- The facets of seniority and personal and positional power did not feature specifically in the attributes listed by the APM (2009, 2018). They might, however, be there by inference. The fact that seniority and power did not feature specifically could be coupled to the guide being prepared for projects in general. It was stated: 'This guide is intended to provide support to sponsors of all sizes of projects' (APM, 2018, p. 8). This statement provided some credence to the perspective on seniority and power;

- 'Provides clarity of direction' was viewed by the APM (2009, 2018) as a facet of the broad listing of competencies making up the 'competence' attribute, whereas the analysis of the data for the research elevated it to a specific attribute. The facet of 'developing a compelling vision' was pertinently included in the attribute for the research;
- A number of facets were listed for the expansion of the 'competence' attribute by the APM (2009, 2018). An evaluation of the list of 37 attributes for the research provided comparable descriptions but these were listed as attributes. In their own right these attributes were not strong enough to compete with those listed as the six essential and five important but not essential attributes a sponsor needed to possess. As indicated earlier, the researcher is of the opinion that further work is required to determine the content of the 'competence' attribute;
- 'Motivated to act in the long-term interest of the organisation' was a facet of the 'credibility' attribute of the APM (2009, 2018). The research elevated the attribute 'act in the long-term interest of the organisation' and coupled it to the 'ability to engage' and 'take personal ownership' attributes to form a standalone attribute. This attribute focused on engagement, ownership and long-term interest of the organisation;
- Although there was a good level of similarity between the two origins of attributes, the work done by the APM was of a 'long-list' nature and did not attempt to prioritise or emphasise certain attributes as being more important than others; and
- Along with the aspect of seniority and personal and positional power, the ability to demonstrate high-level and diverse communication skills, including the ability to listen, was not elevated as a specific attribute neither was it listed by the APM. An indication of the current differences between the competence attribute breakdown of the APM and the research is presented in Table 6.5.

**Table 6.5: Competence attributes not common to
the APM (2009, 2018) and the research**

Detail of competence attribute shown in the APM (2009, 2018) but not in the research	Detail of competence attribute shown in the research (from list of 37 attributes derived from interview analysis) but not in the APM (2009, 2018)
Manages people and other resources effectively	Ability to integrate or coordinate
Motivates people	Political astuteness
Negotiates effectively	Tenacity and determination
Self-aware about strengths and weaknesses	Ability to foster trust
Commercial awareness of risk	Ability to learn and adopt
Strategic risk management	

6.8 SUMMARY

The three methods of analysis included semi-structured interviews, a survey questionnaire and a comparison with literature. This triangulation did not result in a single outcome in which the important and essential attributes of the megaproject sponsor were exactly the same for the three methods of analysis.

However, the convergent findings for the essential attributes (six out of nine attributes were the same or very similar for the survey questionnaire and interview analyses) presented a proposition that tended towards to a single proposition. For the important but not essential attributes the convergent findings presented a less favourable result when compared to the essential attributes, with three out of seven attributes being similar for both methods of analysis. The convergence was only determined after the full evaluation of the similarities and differences from both the survey questionnaire and interview analyses for determining the important and essential attributes had been ascertained. This implied that combining, collapsing and moving attributes between the important and essential categories were first considered before the extent of convergence was determined.

A possible explanation for some of the inconsistent findings and to a certain extent a limitation on the results achieved might be found in the following:

During the interviews the ability of some of the interviewees to identify and differentiate between important and essential attributes was initially found to be challenging. All the interviewees were not necessarily well prepared for the interviews. In a limited number of cases it required repeated effort (without leading questions being asked) by the researcher to probe for the identification of a suitably large number of attributes for analysis purposes.

There was also a 'freedom of choice' difference between conducting the interview and completing the survey questionnaire. The focus difference arose because of the request to identify only a limited number of attributes (both important and essential) in the survey questionnaire. This implies that the interview process provided more freedom for the identification of attributes than the completion of the survey questionnaire process did. The number of quotations (587 in total from 25 interviews) was quite substantial.

The differences identified between the APM (2009, 2018) literature and the combined results emanating from the multiple-method analysis in the research provided further clarity on what attributes were required specifically for a megaproject sponsor. The fact that the attributes had been identified by professionals very knowledgeable in the field of megaprojects, and not for projects in general, lent credence to the clarity derived on the research aim. The

methodologies applied to reach the results as provided have been shown to be reliable. This statement is made based on the fact that the propositions arrived at were achieved after good and proper challenge and analysis from a number of perspectives and methodologies. Utilising the data responsibly to construct plausible explanations of the attributes certainly contributed to making sense in a domain where the contribution to project success by the sponsor had not yet been fully internalised.

The chapter dealing with the conclusions and recommendations of the research follows next.

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CHAPTER 7

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

This chapter provides an overview of the contribution of the research to knowledge, the implications it has for existing theory, context and management, the limitations of the research and how conclusions were reached. It also creates an agenda for future research.

A megaproject is a large-scale, complex venture that typically costs US\$1 billion or more, takes many years to develop and build, involves multiple public and private stakeholders, is transformational, and influences millions of people. Megaprojects are failing at a rate that affects national economies and millions of people. The role of the executive sponsor on a megaproject is merely one of the decisive factors in the success of these projects, but is still much neglected in project management literature.

Often international studies within the context of the dissertation contained very few if any South African input, and the results were regularly standardised to South African conditions.

A publication explaining the underlying causes for over-budgeted and delayed industrial megaprojects that were also not delivering on the business case used a global database of 318 projects (Morrow, 2011). Of this number of megaprojects 9% were from Africa. The 9% did not include any from South Africa. The implication of this was that there was very limited representation of South African megaprojects in the database.

Whilst assessing the responsibilities and accountabilities of the sponsor in literature, a consistent two-part theme was identified. Contextually, the themes revolved around:

- A relationship between the personal attributes of the individual carrying out the role of sponsor and how it directly influenced his/her effectiveness; and
- The relationship between the effectiveness of the sponsor and it being the single best predictor of project success or failure.

These relationships are indicated in Figure 2.2 in Chapter 2 and Figure 3.1 in Chapter 3.

The relationship between the attributes of the sponsor, effectiveness of the sponsor, and project success was considered fundamental to achieving the research aim, i.e., to identify the important and essential attributes of a megaproject sponsor.

The research aim was achieved using a qualitative deductive multiple-case study research approach to answer six research questions. For the multiple-case study approach six megaprojects were selected. The six projects are presented in Table 4.3 in Chapter 4.

The selection of the individual projects was based on the accessibility and availability of senior managers and consisted of three private and three public-sector megaprojects. All the projects were completed since 2006.

Interviews for the research were conducted with 26 high-ranking participants representing the following roles on the projects:

- Individuals on the board or executive management of the organisation responsible for appointment of the sponsor;
- Sponsors appointed on the megaprojects; and
- Project managers appointed on the megaprojects

The interviewees were all in the senior management or executive management levels of their respective organisations. Between them they collectively totalled *circa* 250 years of megaproject experience. After the completion of a semi-structured, open-ended, one-on-one interview, the interviewee was requested to fill in a survey questionnaire.

The survey questionnaire was developed from a comprehensive analysis of sponsor attributes mentioned in related literature. The data from the survey questionnaire was analysed through a bottom-up numerical methodology. The data from the one-on-one semi-structured interviews was analysed with the qualitative content analysis method using ATLAS.ti as the Computer-assisted Qualitative Data AnalysisS (CAQDAS) package of choice.

7.2 CONTRIBUTION OF THE RESEARCH TO KNOWLEDGE

This research contributed to current knowledge in the following broader and more holistic themes derived from literature. The themes are:

- There is a relationship between the attributes of an individual performing the role of the sponsor and the effectiveness of the individual (APM, 2009, 2018; Barshop, 2016; Crawford, Cooke-Davies, Hobbs, Labuschagne, Remington and Chen, 2008; Morris, 2013; PMI, 2014; Remington, 2011; West, 2010); and
- The effectiveness of the sponsor is the single best predictor of project success (APM, 2009, 2018).

Previous research identified sponsor attributes in general and not for megaprojects specifically. Part of the aim of the research was the identification, within the broad array of

attributes described by literature, of those attributes that are important for the sponsor on a megaproject to possess.

The important attributes were further refined in the research to those that were essential for a sponsor to possess. Motivation was also provided for reducing the number of attributes required to the realistic minimum that could be expected of one individual.

The contribution of the research to knowledge was typically considered at three separate levels, i.e., whether it contributed to theory (extension, refinement or generation), method (application of a new methodology in an existing field) or context (e.g. how the findings translated beyond the contextual limitations of the here and now) (Ridder, Hoon and McCandless, 2015; Volschenk, 2016; Whetten, 1989).

This research contributes to theory and context and has implications for executive management.

7.2.1 Contribution to theory

As the exploration of the literature for the research unfolded, the relationship described in Figure 2.2 in Chapter 2 and Figure 3.1 in Chapter 3 crystallised. The researcher contends that this relationship and its description is novel and has not been documented before. The relationship between personal attributes and sponsor effectiveness and the relationship between sponsor effectiveness and project success can be found separately in current literature. Combining these separate components into one relationship is where the novelty exists. Its contribution to improve the poor performance of megaprojects is potentially significant.

A further contribution to theory is that the research has now created an improved understanding of the importance of the various attributes that a sponsor should possess. It has been identified that a limited number of attributes were essential and similarly that a limited number of attributes were important but not essential. The ranking established between essential and important but not essential attributes makes an additional contribution to theory.

7.2.2 Contribution to context

The research does contribute to context. This conclusion is based on the perspective that the research relates specifically to the South African context for megaprojects that has not been studied before. Additionally, the participants in the research (interviewees who were also the survey questionnaire respondents) were all individuals with substantial South African megaproject experience. Often international studies within the context of the dissertation contained very few if any South African input, and the results were regularly standardised to South African conditions.

As far as could be ascertained, the relationships between the attributes of megaproject sponsors, their effectiveness and project success (Figure 2.2 in Chapter 2) had not been investigated before.

This research contributes to the sparse literature on the topic by identifying the realistic minimum number of important and essential attributes required by sponsors of megaprojects. It furthermore provides guidelines for executives and company boards who have to appoint sponsors for megaprojects.

7.2.3 Implications for executive management

Although not a contribution to knowledge at the theory, method or context levels, this research contributes especially to the executive management responsible for the identification and appointment of a sponsor.

Not only has the research crystallised from current literature a condensed set of essential (and larger set of important plus essential) attributes that can be assessed for prior to the appointment of a sponsor, these attributes can also readily be accommodated in one individual. Along with the minimum number of sponsor attributes that this research has produced, a guide to the types of assessment instruments (psychometric and other) that can be used in the identification of said attributes has also been developed.

The use of these guidelines (to appoint an individual that possessed most of the essential attributes), and ensuring that these attributes were effectively applied should be formalised for executive management. The relationships identified in Figure 2.2 in Chapter 2 substantiate a conclusion that the probability of achieving a successful project will be enhanced.

The ranking of the attributes is a contribution to executive management that could extend beyond the borders of South Africa. Although the research was based on South African case studies, it is good practice and nothing should prevent executive management globally from taking cognisance of the findings of this research in the appointment of a sponsor for any megaproject.

7.3 LIMITATIONS OF THE RESEARCH

Those aspects that were not studied in the research are described as follows:

An appraisal of the broad array of attributes as identified from the literature may suggest that a single individual was unable to fulfil the full spectrum of attributes. Remington (2011) supported this perspective with the additional comment that the right teams could fulfil all the attributes. James, Rosenhead and Taylor (2013) shared this perspective that all the

attributes were rarely found in one person. Similarly, De Klerk (2014) reflected that the list of recommended leadership characteristics and traits (attributes) prescribed in the literature were unrealistically comprehensive and optimistic. The referenced literature indicated that the 'normal' human being had a limited capacity and a reasonable expectation was for an individual to accommodate five to 10 attributes where seven appeared to be a practical number. No empirical data was obtained during the research to support this assumption.

At one stage the researcher did consider the use of statistics to assist in the research. Reservations about the size of the sample (26 individuals) influenced the decision against this. In a related and somewhat similar study on the project manager's personal attributes as predictors for project success, Valencia (2007) stated that the sample size of 23 available project managers was the greatest limitation for the study.

Valencia also stated that a small sample normally resulted in the statistical tests performed being less powerful. This could possibly result in certain statistically significant results being produced by chance. Valencia concluded that should certain statistically significant results materialise by chance there was a strong possibility that false conclusions about the project managers could be arrived at.

As explained in Chapter 2, there is general (albeit implied) agreement that the sponsor or sponsorship role may be carried out by an individual or a group of people, such as a sponsoring group, project board, executive committee or steering committee. However, a number of authors referred to the project sponsor from the perspective of an individual or single person (APM 2009, 2018; Barshop, 2016; Bourne, 2015; Bryde, 2008; James et al., 2013; Morris, 2013; PMI, 2014; Van Heerden, Steyn & Van der Walt, 2015; West, 2010). The research only focused on the sponsor as an individual and the 'group of people' configuration was not studied.

It was evident from the interview process that a number of interviewees reflected on building blocks that typically can be found in the broad definition of competence, i.e., the combination of knowledge, personal attitude and skills. Examples of such building blocks are *inter alia* judgment, tenacity, determination, ability to integrate or coordinate, fostering of trust, ability to learn and adopt, political astuteness, understanding the role, business, commercial and financial acumen, and ability to make decisions and hold others accountable. The research did not study the optimum configuration of building blocks required for the competence attribute.

The attributes identified from literature were not specifically for megaprojects. There were, however, literature sources that did reflect on the inclusion of large or megaproject sponsors when attributes were discussed. These references included Helm and Remington (2005)

and Remington (2011) in addition to the APM (2018). The researcher contends that the array of sponsor attributes identified from literature is inclusive of the megaproject perspective. The participants in the survey questionnaire and the semi-structured interviews were all individuals with megaproject experience. They did not find it difficult or necessary to differentiate between attributes for projects in general and attributes for megaprojects specifically. The interviewees were also invited to indicate additional attributes that they thought were not already part of the list of attributes identified from literature. The number of additional attributes that materialised from this request was minimal. The researcher contends that this aspect was not a limitation for the research.

The researcher did not investigate the integrity of the processes supporting the appropriation of the funds (approved budgets) and timelines for the respective projects and how it affected the outcomes of the projects. The assumption was made that for the owner organisations involved there would be a quality assurance process to protect the integrity of the estimates and timelines submitted for approval. Given the magnitude of the costs involved, confirmation of the assumption was provided during interview discussions that in all the cases there were indeed quality assurance processes in place. It could, however, not be confirmed that the concept of optimism bias (for costs to be expended, timelines to be met and benefits to be achieved), as presented by Flyvbjerg (2007, 2014), was appropriately taken care of. For the failed projects in the cases studied it was clear that not all the risks in the overall context of the projects that should have been provided for in both the cost and schedule dimensions were in fact attended to.

From a culture perspective, the respective owner organisations involved were not analysed for untowardness of practices during the lifecycle of the projects. Only one owner organisation was accused in the public domain of corruption, nepotism, fraud and bribery during the execution of its megaprojects. The others have not attracted similar media attention.

All the sponsors on the projects made sure that their teams understood that late surprises on cost, schedule and scope deviations would not be entertained. This did not imply that the organisations were 'good-news' organisations. The magnitude of the deviations from both budget and schedule were, however, material in all the failed cases. This necessitated the sponsors to spend an inordinate amount of time explaining the deviations to executive committees and boards. The impact of non-availability or diversion of focus because of these matters was not attended to as part of the research.

In all six cases studied, executive management did not formally take attributes into consideration when identifying prospective sponsors or selecting and appointing a sponsor.

Despite this, two of the projects were successful. The question can be asked whether the attributes of the sponsors on these two projects were in line with the important and essential attributes as identified by the research, and was it just accidental if the answer for the two successful projects was 'Yes'?

This gives rise to a further limitation for the research. The sponsors who participated in the research were not subjected to a series of tests (post their appointment) to establish what their attribute sets consisted of in order to verify the relationships identified in Figure 2.2 in Chapter 2.

7.4 CONCLUSIONS

7.4.1 Research questions

The introduction to this chapter indicates that the research aim is to identify the important and essential attributes of a sponsor on a megaproject. It also indicates that the research aim was achieved by answering six research questions. The research questions were derived from the propositions for the research.

A summarised response to each of the research questions is provided as follows.

7.4.1.1 *Research question 1: How is the potential megaproject sponsor identified and appointed and what are the attributes that he/she should possess?*

No formal assessment process for the identification and appointment of any of the sponsors was found during the analysis of the respective cases. It was thus not possible to successfully determine the 'how' part of the research question through empirical data. However, literature (APM, 2018) provided distinct clarity on selecting and appointing a sponsor.

The attributes a sponsor should possess are listed in Sections 7.4.2 and 7.4.3 below.

7.4.1.2 *Research question 2: How do professionals in the field rank the relative importance of the attributes of megaproject sponsors (assuming not all the attributes are equally important)?*

The extensive managerial experience of the interviewees participating in the research enabled them to rank the attributes with relative ease. They primarily made use of their prior experience to differentiate between important and essential attributes of a sponsor. There was agreement at all levels (executive management, sponsor and project manager) that the attribute 'appropriate senior, empowered and accountable person with (personal and positional) power and credibility' was the highest-ranking attribute.

7.4.1.3 Research question 3: Why are certain attributes of the sponsor on a megaproject defined as important?

The basis for this research question is that a sponsor of a megaproject needs to possess a certain grouping of attributes within the broad spectrum of attributes to be effective in the role. These attributes are considered important. The definition of 'important' for the research is 'having serious meaning or worth: Deserving or requiring serious attention' (Merriam-Webster, n.d.). As explained in Section 7.3, there is a practical limitation to the number of attributes a 'normal' person can possess. For the research (as per the guidance of a range of five to 10 attributes) and assuming that a sponsor is not just a 'normal' person, 11 important attributes were identified. The full list of important attributes as perceived by knowledgeable experts in the domain of megaprojects is the combination of Sections 7.4.2 and 7.4.3 below.

To complete the reasoning on important attributes, it is required to clarify why certain attributes are regarded as essential. The research aim was always intended to be determined in the context of project success. The rationale was thus that a certain grouping of attributes within the list of important attributes should be essential for enhancing the probability of project success. The definition of 'essential' for the research is 'so important as to be indispensable' (Merriam-Webster, n.d.).

It is thus clear that essential is a higher order of importance. It also implies that all essential attributes are important, but not every important attribute is essential.

7.4.1.4 Research question 4: Which important attributes of a sponsor on a megaproject are considered as essential for the project to be a success?

The list of essential attributes is provided in Section 7.4.2 below.

7.4.1.5 Research question 5: Which psychometric and other tests can reliably assess important attributes of a potential megaproject sponsor?

In none of the interviews conducted for the research was it found that psychometric or other tests had been used to assess the important attributes of a potential sponsor. It was, however, possible to develop a framework from literature for the research indicating certain psychometric and other tests to be used for determining:

1. The leadership style of the potential sponsor; and
2. The important attributes of a prospective sponsor.

A framework indicating the representation of the different types of psychometric and other assessment instruments identified and typically used in South Africa is presented in Table 7.1.

Table 7.1: Framework to identify sponsor leadership styles and attributes with assessment instruments (typically used in South Africa)

Purpose used for or identification of	Name of instrument
To determine the transformational leadership style of a prospective sponsor	Multi-factor Leadership Questionnaire (MLQ Form 5X)
To determine the charismatic leadership style of a prospective sponsor	Leadership Behaviour Inventory (LBI)
Capability (to identify thinking when dealing with new information and solving problems of varying complexity)	Cognitive Process Profile (CPP)
Emotional Intelligence (EI)	Bar-On Emotional Quotient Inventory (EQ-i)
Reasoning ability (to measure critical verbal and numerical reasoning skills)	Critical Reasoning Tests, i.e., the Critical Reasoning Test Battery (CRTB)
Personality	<ul style="list-style-type: none"> • Occupational Personality Questionnaire (OPQ) • Neuroticism-Extraversion-Openness Personality Inventory Revised (NEO-PI-R) model • Hogan Personality Inventory (HPI)
Workplace integrity behaviour	Giotto
High-level reasoning ability, personality and outlook	Belbin Team Roles, including Personal Preference Questionnaire (PPQ)
Psychological preferences when making decisions	Myers-Briggs Type Indicator (MBTI)

7.4.1.6 Research question 6: What should the level of active participation of a megaproject sponsor ideally be in order to make a decisive impact on the success of the project?

Executive management considered active participation as knowing what was happening on the project through frequent contact with the project team and key stakeholders. Monthly visits to project sites and meeting with the project manager shortly before reporting to a steering committee or board was found to be the norm.

According to the project managers participating in the research, active and positive participation of sponsors was considered to be:

- Focus on governance-related manners;
- Consistently ensuring that the project supported the business case; and
- Stakeholder management.

7.4.2 Description of essential attributes common to both methodologies

The finalised listing of essential attributes that a prospective sponsor on a megaproject needs to be assessed for as derived from the survey questionnaire and semi-structured interviews methods of analysis is as follows:

1. An appropriately senior, empowered and accountable person with (personal and positional) power and credibility. Credibility is understood in terms of being accepted by the organisation and stakeholders as suitable for the role;

2. Ability and willingness to provide objectivity to the project team and challenge the project assumptions for meaningful alternatives to maximise value in a complex or complicated environment;
3. Ability to provide clarity of direction (includes the ability to develop a compelling vision, understanding strategy of the organisation, appreciating the linkage between the business or project objectives and the corporate strategy, and a focus on results);
4. Ability to have a holistic view (see the big picture), engage peers and take advice from others for key decisions;
5. Understanding of basic project management (can comment constructively at a high level on scope, risk, schedule, and cost management) and has project experience (preferably megaproject experience); and
6. Ability to engage – demonstrated by taking personal ownership, showing commitment and loyalty, and acting in the long-term interest of the organisation.

7.4.3 Description of important attributes that are not necessarily essential

The finalised listing of important but not necessarily essential attributes that a prospective sponsor on a megaproject needs to be assessed for as derived from the survey questionnaire and semi-structured interviews methods of analysis is as follows:

1. Knowledge of the politics of the organisation, being politically savvy and astute in politicised South Africa, particularly on public sector projects;
2. Understanding of the business and business case development and customer (market) profile and operations to enable informed decision-making. If not the full attribute, then as a minimum the business case component thereof must appear on the 'reserve list');
3. Experience of and knowledgeable about the relevant industry from a technical, contractual and institutional perspective;
4. Competence (i.e., the combination of knowledge, personal attitude and skills) to fulfil the role; and
5. Ability to select and keep the key players on the project team and assist the project manager to select and keep the right people at lower levels in the team.

7.5 AGENDA FOR FUTURE RESEARCH

Identifying both the important and essential sponsor attributes is intended to contribute to an increase in the likelihood of megaproject success. This could potentially contribute not only to the health of the South African economy, but also to the health of the economy of the African continent.

Recommendations for future studies include:

- The cases studied in the research only represented South African megaprojects with a construction phase. Further investigation of cases not related to construction (e.g. information technology system implementation) and comparing the important and essential attributes for both scenarios should be undertaken;
- The impact of behaviours such as corruption, nepotism, fraud and bribery on the outcomes of megaprojects, and how the sponsor should utilise his/her attributes in dealing with such behaviours. These behaviours are difficult but not impossible to control;
- As no empirical data was obtained from this research, an in-depth investigation should be undertaken into the use of psychometric or other tests to determine the presence of important and essential attributes in the persona of a prospective sponsor;
- Determining the optimal combination of knowledge, personal attitude and skills to be included in the attribute 'competence for the role';
- Despite the reservations about a small sample size of survey respondents/ interviewees, an investigation into the suitability of non-parametric statistics to detect which number of attributes were more essential than others should be undertaken; and
- A potentially onerous yet value-adding task to correlate project success of a larger number of megaprojects globally with essential sponsor attributes.

Implementing an approach in which the attributes of a potential megaproject sponsor are assessed is neither revolutionary nor a very difficult or costly process. It is also no 'silver bullet' solution to a very complicated problem – the failure of megaprojects. It does, however, have the potential to result in a very significant return on investment.

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APPENDICES

APPENDIX A: INTERVIEW GUIDE FOR INDIVIDUALS ON THE BOARD OR EXECUTIVE TEAM OF THE ORGANISATION RESPONSIBLE FOR THE APPOINTMENT OF THE SPONSOR

Introductory questions

- a. Could you please tell me how this project unfolded with particular emphasis on who the owner of the business case of the project is/was?
- b. Could you please briefly talk me through your view of the importance of an executive sponsor on the project?
- c. How well do you think the board or executive team understands the role of the sponsor on a project and why?
- d. How complete would you consider the brief you provided the designated sponsor when he/she was identified, selected or appointed as sponsor for the project and why?

Essential questions

- a. What do you consider the array of attributes that a sponsor on a megaproject should possess?
- b. What do you consider as the important attributes?
- c. Why do you consider these attributes as important?
- d. How would you rank these attributes, assuming all the attributes are not equally important?
- e. Which of the mentioned important attributes would you consider as essential for project success?
- f. Why do you consider these attributes as essential for project success?
- g. How was the sponsor for the project identified and appointed? Please elaborate on the practices followed, e.g. tests used and factors considered prior to the appointment of the sponsor on the project.
- h. How actively did the sponsor participate on the project?
- i. How did you determine and validate the level of active (or passive) participation of the sponsor on the project?
- j. Please comment on the following: The level of participation of the sponsor is important.
- k. How well do you consider the sponsor reacted to unforeseen circumstances or external factors with specific reference to the utilisation of the attributes of the sponsor?

I. How successful (or not) do you consider the project to have been and why? Please utilise in your response the following thresholds for failure:

- Cost overrun > 25%;
- Slip in execution schedule > 25%; and
- Production versus plan, i.e., significantly reduced production into year 2.

Reflection questions

- a. What would you liked to have been done differently by the sponsor on the project and why?
- b. Is there anything else that you would like to comment on about the role of the sponsor on the project?

APPENDIX B: INTERVIEW GUIDE FOR SPONSOR

Introductory questions

- a. Could you please briefly elaborate on your career to date?
- b. Could you please give me an idea of or clarify your role on the project?
- c. How did you get involved in the project?
- d. How complete would you consider the brief you were given when you were identified, selected or appointed as sponsor for the project and why?
- e. How well do you think the board or executive team understands the role of the sponsor and why?
- f. Could you please provide me with the following:
 - A description of the project;
 - The cost of the project in terms of capital approved or sanctioned and the final cost of the project versus the estimate that the sanction was based on;
 - The duration of the project in terms of the planned duration at the time of sanction compared to the final duration;
 - Major changes or variations experienced on the project; and
 - The impact of extraordinary occurrences during the life of the project, e.g. political, environmental, community and supply chain volatility.
- g. Could you please tell me how the project unfolded, with particular emphasis on your role as sponsor?

Essential questions

- a. What do you consider as the array of attributes that a sponsor on a megaproject should possess?
- b. What do you consider as the important attributes?
- c. Why do you consider these attributes as important?
- d. How would you rank these attributes, assuming all the attributes are not equally important?
- e. Which of the mentioned important attributes would you consider as essential for project success?
- f. Why do you consider these attributes as essential for project success?
- g. Having given your opinion on important and essential attributes, please share with me which of these attributes you consider as your strengths and which you think you lacked capacity in.

- h. How were you identified and appointed as the sponsor for the project? Please elaborate on the practices followed, e.g. tests used and factors considered prior to your appointment.
- i. How actively did you as sponsor participate on the project?
- j. What is your reasoning regarding your level of participation as the sponsor on the project?
- k. Please comment on the following: The level of participation of the sponsor is important.
- l. How well do you consider you as sponsor reacted to unforeseen or extraordinary circumstances or external factors you described above, with specific reference to the utilisation of the attributes that you possess?
- m. How successful (or not) do you consider the project to have been and why? Please utilise in your response the following thresholds for failure:
 - Cost overrun > 25%;
 - Slip in execution schedule > 25%; and
 - Production versus plan, i.e., significantly reduced production into year 2.

Reflection questions

- a. What would you have liked to do differently yourself as the sponsor on this project and why?
- b. Is there anything else that you would like to comment on about your role as the sponsor on this project?

APPENDIX C: INTERVIEW GUIDE FOR PROJECT MANAGER

Introductory questions

- a. Could you please briefly elaborate on your career to date?
- b. Could you please give me an idea of or clarify your role in this project?
- c. How did you get involved in this project?
- d. Could you please tell me how this project unfolded, with particular emphasis on your role as project manager?

Essential questions

- a. What do you consider the attributes that a sponsor on a megaproject should possess?
- b. What do you consider as the important attributes?
- c. Why do you consider these attributes as important?
- d. How would you rank these attributes, assuming all the attributes are not equally important?
- e. Which of the mentioned important attributes possessed by the sponsor would you consider as essential for project success?
- f. Why do you consider these attributes as essential for project success?
- g. What is your opinion of the extent to which the sponsor actually met or possessed the attributes that you identified as both important and essential?
- h. How were you identified and appointed as the project manager for the project? Please elaborate on the involvement of the sponsor prior to and during your appointment as the project manager.
- i. How actively do you think the sponsor participated on the project?
- j. What is your reasoning regarding the level of sponsor participation required on the project?
- k. Please elaborate on the following: The level of participation of the sponsor is important.
- l. How well do you consider the sponsor reacted to unforeseen circumstances or external factors with specific reference to the utilisation of his/her attributes?
- m. How successful (or not) do you consider the project to have been and why? Please utilise in your response the following thresholds for failure:
 - Cost overrun > 25%;
 - Slip in execution schedule > 25%; and
 - Production versus plan, i.e., significantly reduced production into year 2.

Reflection questions

- a. What did you appreciate most about the role of the sponsor on this project with specific reference to the interaction between yourself and the sponsor?
- b. What would you liked to have been done differently by the sponsor on the project and why?
- c. Is there anything else that you would like to comment on about performance of the sponsor on the project?

APPENDIX D: CASE STUDIES (PROJECTS)

1. Ingula pumped-storage scheme project

Project purpose

The scheme functions as peaking plant, providing 1 332 MW of electricity during periods of peak demand on the national network. The project is also intended to reduce the dependence of the national electricity utility on using very costly diesel-powered open-cycle gas turbines.

Specifics of sponsor

The sponsor role was not a full-time role and no formal appointment of the individual in the role took place. Appointment in the role (2007) occurred a number of months prior to commencement of the construction phase. The sponsor did, however, prior to being given the responsibility for the clean technology project portfolio, spend about six months on the project during the pre-feasibility study in order to get it going. No psychometric or other assessments were performed to determine the suitability of the individual for the role. The sponsor was continuously involved for the total duration of construction, commissioning and handover.

Key measures used for determination of success or failure of project (Merrow, 2011)

- Budget capital cost: US\$0,89 billion. Actual capital cost: US\$3,6 billion
- Planned completion (testing, commissioning and fully operational): End 2013. Actual completion: Beginning 2017.
- Both budget and planned duration were exceeded by more than 25%.
- Operability: Significant deviations occurred within the first two years of commercial operations.

2. Gautrain rapid-rail link project

Project purpose

The purpose of the project was to establish a rapid-rail transit system linking the cities of Johannesburg and Pretoria and OR Tambo International Airport.

Specifics of sponsor

The project leader (the *de facto* sponsor), as the director-general of the Gauteng Department of Public Transport, Roads and Public Works, was appointed as project leader on the project in 2004. In 2006 he was also appointed CEO of the management agency

established for the project. From the interview with the sponsor, it was clear that he was responsible for all aspects of the business case.

The sponsor role was not a full-time role and no formal (documented) appointment of the sponsor in this role took place. No psychometric or other assessments were performed to determine the suitability of the individual for the role.

Key measures used for determination of success or failure of project (Merrow, 2011)

- Budget capital cost: The contract price agreed in September 2006 (US\$2,51 billion) was considered as the budget. Actual capital cost: US\$2,81 billion with US\$0,24 billion for operational and support costs. US\$3,0 billion final cost foreseen (Thomas, 2013).
- Planned completion: Contractual completion date was June 2011 (57 months after contract signature). Actual completion: Operational readiness achieved mid-2012.
- Operability: No significant deviations within the first two years of commercial operations.

3. New multi-product pipeline project

Project purpose

During 2005, the national government commissioned a report on fuel shortages in the country. The report indicated that additional pipeline capacity was 'urgently required to supply inland markets'. It also indicated that the development of a new pipeline was to be accelerated. The pipeline needed to transport three types of fuel, i.e., petrol, diesel and jet fuel.

Specifics of sponsor

The sponsor initiated the project in early 2000. He demonstrated and claimed very strong ownership of the business case. As managing director of the pipelines division within the national rail, port and pipeline utility, he was a sponsor 'with absolute authority and responsibility' but did not 'own' or have overall accountability for the business case in his later role as group executive. As group executive, he stated that 'the sponsor had no teeth but was still kept accountable'. The sponsor role was not a full-time role and no formal (documented) appointment of the individual in the sponsor role took place. No psychometric or other assessments were performed to determine the suitability of the individual for the role.

Key measures used for determination of success or failure of project (Merrow, 2011)

- Budget capital cost: Initial estimated cost US\$0,95 billion. Actual capital cost: US\$3,04 billion in 2017.

- Planned completion: 2010. Construction of the pipeline commenced early 2008. Actual completion was 2017.
- Both budget and planned duration were exceeded by more than 25%.
- Operability: Deviations within first two years of commercial operations are yet to be determined and confirmed.

Comment from owner

The owner does not agree with the researcher in terms of the outcome of the project and the criteria used to determine the outcome. In the owner's perspective the overall objective of the project was to ensure security of supply for the inland markets, which it did. The owner further argues that all necessary approvals were obtained for the various increases in cost and schedule. The owner view is accordingly that the project was a success.

4. Fischer-Tropsch wax expansion project

Project purpose

The purpose of the project was to double the production of hard wax by the integrated energy and chemicals company in its South African operations. The wax business unit of the company accordingly undertook a synthetic (Fischer-Tropsch-technology-based) hard-wax expansion project. The investment for the project was approved in December 2009.

Specifics of sponsor

There were two sponsors on the project. The initial sponsor was the originator of the concept to double the production of hard wax. He was appointed managing director of the wax business unit and as sponsor on the project in 2006 but he relocated to the USA in 2012, creating an uneasy situation for the project manager regarding the lack of continuity of the sponsor on this complicated project. The senior vice president responsible for operations of the company in the Free State Province was appointed as the second sponsor in 2013.

No psychometric or other assessments were performed to determine the suitability of either individual for the role.

Key measures used for determination of success or failure of project (Merrow, 2011)

- Budget capital cost: US\$0,84 billion. Actual capital cost: US\$1,36 billion.
- Planned completion: Phase 1 was expected to come into operation in 2012. Construction of Phase 1 began March 2010. Phase 2 was expected to come into operation by 2014. Construction of Phase 2 began 2014. Actual completion was 2017.
- Both budget and planned duration were exceeded by more than 25%.

- Operability: No significant issues negatively impacting operability of plant were encountered.

5. Growth programme for Synfuels Secunda facility

Project purpose

The purpose of the project was to use the full capacity of natural gas delivered after completion of a natural gas pipeline project from Mozambique to South Africa. For this purpose the integrated fuels and chemicals company launched the Natural Gas and Secunda Growth Programme (NG&SGP).

Specifics of sponsor

There were two sponsors on the programme. The initial sponsor commenced with the role in 2004 while he was managing director of the gas business unit of the company. In the beginning it was not a full-time role but he was allocated to the NG&SGP on a dedicated basis in 2006, after which he was accountable for the success of the programme that spanned across three business units. This necessitated a strong focus on the overall group objectives of the company.

As sponsor he reported directly to the group executive responsible for the South African energy businesses where he played the sponsor role until his retirement at end 2009.

The second sponsor took over the role at the beginning of 2010. As sponsor and senior vice president responsible for the synthetic fuels operations of the company in the Mpumalanga Province, he reported to the group executive responsible for South African operations.

For both sponsors no formal (documented) appointment process as sponsor was followed. No psychometric or other assessments were performed to determine the suitability of either individual for the role.

Key measures used for determination of success or failure of project (Morrow, 2011)

- Budget capital cost: US\$1,415 billion. Actual capital cost: US\$1,415 billion
- Planned completion: September 2013. Actual completion: September 2014.
- Only the planned duration was exceeded by more than 25%.
- Operability: No significant operational deviations were encountered within the first two years after start-up.

6. Collieries replacement/ expansion programme

Project purpose

Four ageing coalmines had to be replaced as their reserves were approaching their end of economically mineable life. The mining division of the integrated energy and chemical company undertook the programme. The coalmines are located in the coalfields of the Mpumalanga Province in the proximity of the synthetic fuels facility of the company.

Specifics of sponsor

There were two sponsors on the programme (from early 2007 to end 2018). The role was not a full-time one, but merely part of the sponsors' functions as members of the executive team of the mining division.

The initial sponsor assumed the programme sponsor role in early 2009, handed over the role in mid-2014 and, because of organisational redesign considerations, assumed it again in mid 2018. The second sponsor took over the role mid 2014, and handed it back in mid 2018 because of the mentioned company reorganisation.

Neither individual was allocated full-time to the sponsor role. No formal (documented) appointment process was followed. No psychometric or other assessments were performed to determine the suitability of either individual for the role.

Key measures used for determination of success or failure of project (Merrow, 2011)

- Budget capital cost: US\$1,58 billion. Forecast capital cost: US\$1,53 billion.
- Planned duration: The schedule for the programme was determined on a staggered basis. As the programme unfolded, more clarity was reached on the completion dates for each of the mines. Actual completion: The programme is progressing as intended with completion forecast for mid 2019.
- Operability: Thus far, no significant operational deviations were encountered within the first two years after start-up of the mines that were completed.

APPENDIX E: WORK EXPERIENCE OF PARTICIPANTS

1. JOB TITLE: EXECUTIVE MANAGER

1.1 Senior executive (acting): Group Capital division

- Career of 32 years with national electricity utility in a number of senior management positions.
- First 20 years of career in power generation portfolio within the areas of operations, maintenance and plant engineering of operating plant, specifically generating electricity and power stations.
- Last 12 years of career in two positions in the managing of projects domain. Initially responsible for the portfolio of projects without the large projects (> ZAR300 million). Subsequently responsible for the full portfolio of projects, including the larger projects currently under construction.

1.2 Chairman of Inter-governmental Steering Committee for rapid-rail link project (also representing National Treasury)

- Involvement with rapid-rail link project commenced in 2000 while a member of the Public Private Partnership (PPP) Unit in National Treasury. Person in the unit allocated to the rapid-rail link project in 2000 when the project was in its very early stages.
- Subsequently appointed as head of the PPP Unit in 2005. Then moved to role as the Treasury representative on forums for the project, i.e., Evaluation Committee, Coordination Committee, Inter-governmental Steering Committee and later the Management Agency board as National Treasury observer.
- Currently Chief Operating Officer of Management Agency established to oversee the operations and maintenance of the system by the concessionaire.

1.3 Senior Group Executive Director: Global Chemicals and North American Operations

- Career of more than 20 years with global petrochemicals group in a number of senior management positions.
- Member of group's executive committee responsible for major operating businesses including solvents, polymers, olefins and surfactants, explosives and fertilisers, and wax divisions and North American operations (Lake Charles Chemicals project). Also responsible for group's planning and optimisation, operations excellence and marketing and sales centre of support activities.

- Currently CEO of large diversified packaging manufacturer in South Africa.

1.4 Executive Vice President (EVP): Southern African Operations

- Career of 25 years with global petrochemicals company.
- Currently EVP: Southern Africa Operations and member of the group executive committee. As group executive responsible for the synthetic fuels, oil, joint venture refinery and gas divisions of the company.
- During career was Managing Director of polymers, olefins and surfactants and nitrous chemicals (explosives and fertilisers) divisions of the company.
- Also served as operations representative on large capital projects for the alpha olefins division in the earlier part of his career.

1.5 Group Chief Capital Officer

- Career of 27 years in state-owned port, rail and -pipeline company.
- During career performed various roles in the built environment. These roles involved from functioning as an engineer doing detail designs to becoming a project manager.
- Has also functioned as manager of an internal consulting division, senior manager in the capacity planning domain and eventually heading up the group planning function of the company.
- Currently the Group Chief Capital Officer and member of the executive committee responsible for long-term planning, capital business case support, execution of megaprojects and engineering and technical support for capital projects.

1.6 Group Executive: Synthetic Fuels division

- Career of 38 years with global petrochemicals company.
- Prior to position of group general manager and member of the executive committee was also MD for the joint venture refinery and MD of the synthetic fuels division of the company.
- As group general manager was at different times responsible for technology, safety, health and environment (SHE), and sustainable development, synthetic fuels and operations excellence at group level.

1.7 EVP: Upstream and Business Enablement

- Career of 37 years with global petrochemicals company, primarily in mining division.
- Core part of career was in the mining division, progressing through the ranks and appointed as MD of the mining division. Thereafter also MD of the nitrogen-based chemicals division.
- As EVP: Upstream and Business Enablement and member of the group executive responsible for the mining, supply chain, SHE, information management and functional excellence divisions of the company.

1.8 MD: Mining division, now Senior Vice-President (SVP): SHE

- Career of 30 years with global petrochemical company mainly in operations spanning the synthetic fuels, joint venture refinery and mining divisions.
- Core part of career at the mining division, progressing through the management levels up to MD for a period of five years.
- Involvement in the Collieries replacement/ expansion programme as the MD and strategically sponsoring the project. The board of the mining division measured certain specific key performance indicators of the division related to the project.
- Thereafter became group general manager and as SVP: Risk and SHE is responsible for SHE (recently expanded to also include risk management).

1.9 MD: Mining division

- In mining for 37 years, most of career in gold mining. Involved with AngloGold Ashanti and then Harmony Gold Mining Company through mergers and acquisitions.
- Initially responsible for coal and platinum divisions of Harmony, then joined the mining division of global petrochemicals company as MD. Returned to Harmony as CEO.
- Involvement with the Collieries replacement/ expansion programme similar to the role description of the previous MD of the mining division. Also strategically sponsored the Collieries replacement/ expansion programme and reported to the board on key performance indicators for the mining division related to the project.

1.10 Interviews were also conducted with:

1.10.1 Senior Manager: Project Management Office (PMO)

- Career of nearly 30 years with national electricity utility.
- Responsible for leading and implementing the process to build the required capacity for PMO implementation throughout the company.
- Responsible for leading the process of setting up project offices throughout the company. This ensured the utilisation of a standard, simplified and optimised project management methodology and building maturity in the process, systems and human capacity.

1.10.2 Senior Manager: Capability Assessment and Diagnostics

- Career of 31 years with national electricity utility.
- During career was Human Resources Manager for the company for the North West region of the country.
- Thereafter became the chief psychologist of the company.
- As Senior Manager is currently responsible for psychometrics and skills assessment.

2. JOB TITLE: PROJECT SPONSOR

2.1 Alternative Energy Divisional Executive

- Career of 35 years with national electricity utility.
- After periods in operations (managing electricity supply transmission and distribution), marketing (regional) and engineering management. Was promoted to Senior Executive position in the unit providing specific transmission and generation project services.
- The unit was commercialised and globalised. Spent a year in West Africa setting up a utility business.
- Upon return to South Africa appointed as General Manager: Clean Technology Projects. In portfolio had pumped-storage power generation project, a wind farm project and the project for the implementation of gas turbines in the Western Cape province.

2.2 Project Leader and CEO: Gauteng Provincial Government/ Management Agency

- Career of more than 41 years in the public transport domain of Gauteng province.
- Appointed in 1994 as team leader of a strategic management team tasked with developing, structuring and establishing a new Department of Public Transport and Roads in Gauteng province. Headed the department for 10 years. Department later restructured to include Public Works.
- In this period also appointed as project leader (sponsor) for the rapid-rail link project. Appointed to the project on a full-time basis in 2004.
- Appointed two years later as the CEO of the Management Agency tasked with overseeing the building and operation of the rapid-rail link by the concessionaire.

2.3 MD: Capital Projects division

- Career with the state-owned port, rail and pipeline company that spanned for almost 40 years. Started off in technical (engineering) and later migrated to the managerial side.
- Promoted to CEO of pipeline division during early 1990s and remained in the position for the next 20 years. Assumed the role of the sponsor of the new multi-purpose pipeline project (NMPP) from the start of the project in early 2000.
- In 2012 promoted to Group Executive. As member of the executive committee was responsible for all capital projects for the state-owned port, rail and pipeline group of companies. He continued in the role of sponsor until retirement in 2014.

2.4 MD: Wax division

- Career of 24 years with global petrochemicals company.
- Joined the company in the early 1990s after having worked for a state-owned company dealing with the enrichment of minerals for eight years.
- Commenced career in the company as an export manager. Then became a Business Manager and eventually a General Manager of the phenolic(s) division of the company.
- Subsequently became the MD of the wax division. Directly involved in driving the concept and business case for the project to double the hard wax capacity of the company (FTWEP). By default assumed the role of the sponsor at the same time.
- Was made responsible as EVP (sponsor) for the megaprojects of the company in the US. Took early retirement in 2014.

2.5 SVP: Operations division

- During career of 30 years with global petrochemicals company has been in a variety of operational and business positions for the divisions of the company located in the Free State province. At various stages responsible for:
 - Site services division (product logistics and laboratories, SHE and risk, asset management and site infrastructure) as General Manager;
 - The ammonia and the wax businesses as Business Manager; and
 - Joint venture (with French petroleum company) refinery as MD.
- Subsequently became MD and then SVP responsible for all non-mining operations of the company for the total site located in the Free State province.

2.6 Group General Manager/ Director: Synfuels Growth Programme

- During a career of 37 years, plus a number of contract years, with global petrochemicals company has been in a variety of operational, business and project management positions, such as General Manager in synthetic fuels and group technology divisions and MD for alpha olefins, explosives and gas divisions.
- Very early in career was given project experience as client representative in offices of German engineering company during the design and construction of two coal-to-liquid fuels megaprojects.
- Drove the business case for the natural gas ex Mozambique programme of the petrochemicals company. Later became the sponsor on a dedicated basis for the project to enable the growth of the facilities of the company in the Mpumalanga province from natural gas.

2.7 General Manager: Group Production Optimisation, now SVP: Synthetic Fuels Operations division

- During a 30 year career at the global petrochemicals company has held various positions in engineering in the group technology division and operational management, primarily at the synthetic fuels division in Mpumalanga province. Has worked in South Africa, the US and Qatar for the company in a technology management capacity.
- Experience also includes a period of time as General Manager responsible for group production optimisation.
- Currently the SVP responsible for the synthetic fuels complex of the company in Mpumalanga province.

2.8 VP: Mining Services for mining division

- During a 31-year career in the mining division of the global petrochemicals company has held various positions in the operational and technical sphere that concluded with becoming General Manager/ VP for SHE and Mining Services for the mining complex. Included were the responsibilities for mineral resource management, project management services, SHE, and information management.
- During this period assumed the role of sponsor on the Collieries replacement/expansion programme.

2.9 VP: Operations in province and Innovation for Mining division

- During a 20-year career at the global petrochemicals company has held a number of positions in production management, shaft management and mine management (General Manager for a specific mine)
- During this time spent two years as a tunnel manager and production or statutory mine manager for a coal mine in New Zealand.
- After return from New Zealand has, as VP, held the position of sponsor on the Collieries replacement/ expansion programme and the mining interest of the company in the Free State province.
- Is currently as VP: Innovation the chief transformation officer for the mining division responsible for developing a coalmine for the future and benchmarking for an improvement programme throughout all the mining interests of the company.

3. JOB TITLE: PROJECT MANAGER

3.1 Project Director

- During a career of 28 years with national electricity utility held various positions in the fields of maintenance, outage, information technology and production management.
- Became involved in the pumped-storage scheme project as project manager responsible for the main access tunnel.
- Thereafter was for a year responsible for the concept and design phases of a rail project at a coal-fired power station in Mpumalanga province.
- Returned to the pumped-storage project as project director for the total project. Responsible for completion of the project.

- Currently (again) responsible for the major rail project of the company mentioned above. This project is described as ‘the implementation of a coal transportation system to convey approximately 14 million ton of coal per annum to a coal-fired power station of the company’.

3.2 Project Coordinator: Gauteng Provincial Government/ Management Agency

- During career of 51 years held various positions in the consulting engineering profession with specialisation in transportation engineering.
- Commenced career with a large consulting engineering company right after university studies. Progressed to MD of the company.
- Ventured into politics in the mid 1990s at provincial and local government level as member of the executive committee in the (old) Transvaal (now Gauteng province). Responsible amongst others for local government, roads and transport.
- Left politics and returned to previous consulting engineering company. Decided to start and was MD of a company that focused on transportation planning.
- When pre-feasibility study for the rapid-rail link project was complete, was requested by the Gauteng Provincial Government to participate in the project. Appointed by the project leader (sponsor) as project coordinator (project manager).
- Simultaneous with appointment as project coordinator became CEO of the consulting engineering company from start of career.
- Held both positions for three to four years and then decided to join the rapid-rail link project on a full-time basis. Retired at the end of 2018.

3.3 General Manager: Project Execution

- During a career of 48 years with the state-owned port, rail and pipeline company held a number of senior positions in both the pipeline and capital project divisions of the company.
- As Manager for New Projects in the pipeline division, was responsible for project management and consultancy-type work on major capital projects and on pipeline-related business for external clients.
- As Manager (Technical & Projects) was responsible for technical policy and the integrity of the assets of the pipeline division.
- Also responsible for the overall management and coordination of multi-disciplined major capital projects undertaken by the division. In this role on the NMPP reported directly to the CEO of the pipelines division. Retired at the end of 2018.

3.4 Project Director: Group Technology division

- During career of 27 years at global petrochemicals company held various positions, for instance in operations (electrical power generation) and project management at the facilities of the company in the Free State province.
- In the project management domain and in addition to the FTWEP, has had opportunities to work for the company in the Free State province on:
 - The total infrastructure required for the incorporation of natural gas from Mozambique into the Free State province site; and
 - The rollout of a project for process safety management.
- Additionally has had the opportunity to work for the company in China (erection of a warehouse) and Iran (erection of an ethylene cracker and the accompanying polyethylene plants).
- Eight years of career has been dedicated to the FTWEP at the site of the company in the Free State province.

3.5 Technical Director/ Engineering Manager

- During career of 39 years spent between two to three years in operations management and the rest in project and engineering management.
- In the time spent with the group technology division of the global petrochemicals company was the engineering manager during the front-end phases of two gas-to-liquids megaprojects, one in Qatar and the other in Nigeria.
- As manager of the engineering management function and member of the group technology management team was responsible for:
 - Development of project stage gate model and other relevant project tools and methodologies;
 - General guidance and leadership of projects, e.g. being member of steering committees for various projects.
- Involvement in megaprojects of the company in South Africa as engineering manager/ technical director for:
 - A project that was necessitated by a government directive that lead-free petrol and low-sulphur diesel be introduced in South Africa from beginning 2006;
 - The growth project of the company's facilities in Mpumalanga province from natural gas; and
 - Clean fuels refinery conversion necessitated by change in legislation.

- In the mid 2000s spent 18 months at the olefins and surfactants division based in Germany. As General Manager was responsible for research and development alignment, global information management, product stewardship and capital project portfolio management for the division.

3.6 Project Director

- During a career of 40 years in the mining division of the global petrochemicals company held various positions in the drawing and design office of the mining division. Spent some time in the production department of one of the mines of the division.
- Seven years after joining the company became involved in project management, running a diverse number of projects, originally mostly of a multi-disciplinary engineering nature.
- Eventually became head of the project management department for the mining division. Continued to carry this role in parallel with being the project director for the Collieries expansion/ replacement programme.
- After about two-thirds of the completion of the programme needed to leave the project because of retirement requirements of the company, but services were extended on a contract basis until very near to the end of the project.

APPENDIX F: FINAL LIST OF CODES IDENTIFIED FROM INTERVIEW DATA

List of 37 codes arrived at during the analysis of the interview data with numbering retained from the initial list of 66 codes after initial list had been analysed for codes that could be merged, i.e., collapsed, integrated or included in other codes:

1. Ability and willingness to partner with project manager and project team to deliver on objectives;
7. Ability to follow a structured thinking process, and ensure that governance for the project is in place;
10. Ability to celebrate also the smaller successes on the project at a regular frequency;
11. Ability to demonstrate high-level and diverse communication, including the ability to listen;
14. Ability to delegate authority to appropriate levels, support the delegation, provide ad-hoc support, keep project manager accountable and not micromanage;
15. Ability to develop and foster (high-level) relationships and connections (networking) and demonstrate compatibility with key players in organisation;
17. Ability to engage, demonstrated by taking personal ownership, showing commitment and loyalty, and acting in the long-term interest of the organisation;
20. Ability to foster an atmosphere of trust and transparency with project manager and team;
21. Ability to identify, map and manage stakeholder expectations, both internally and externally;
22. Ability to integrate, coordinate, organise and facilitate key issues on the project from a leadership perspective;
25. Ability to make decisions swiftly, take responsibility for the decisions and hold individuals accountable for outcomes;
27. Ability to manage conflict, particularly with those parties outside the authority of the project manager;
30. Ability to manage self and own skills set, exhibit high capability for self-reflection, be open to learning from independent project reviews, engage other experts in problem-solving and adopt best practices where appropriate;
33. Ability to provide clarity of direction (includes the ability to develop a compelling vision, understanding strategy of organisation, appreciating linkage between business and project objectives and the corporate strategy, and focus on results);

- 34. Ability to provide leadership in the context of the culture and values of the organisation;
- 35. Ability to provide motivational support for the project team when the going gets tough;
- 36. Ability and willingness to provide objectivity to the project team and challenge the project assumptions for meaningful alternatives to maximise value in a complex or complicated environment;
- 37. Ability to remain calm in a complex or complicated environment in pressurised conditions;
- 38. Ability to take holistic view (see the big picture), engage peers and take advice from others for key decisions;
- 39. Ability to select and keep the key players on the project team and assist the project manager to select and keep the right people at lower levels in the team;
- 40. Ability to sell the business case for the project;
- 41. Ability to serve as focal point for decisions beyond scope and authority of the project manager and act as 'barrier buster' when required;
- 43. Ability to understand and manage risk both externally on and internally to the project;
- 45. Understands basic project management (can comment constructively at a high level on scope, risk, schedule, and cost management) and has project (preferably megaproject) experience;
- 47. Ability to understand (at the appropriate high level) the technology or engineering and other technical aspects involved in the project;
- 50. Ability to use judgment and deal with compromises or trade-offs based on experience;
- 51. Believes that continuity of the sponsor is important and essential throughout the lifecycle of the project;
- 52. Knowledge of politics of organisation, being politically savvy and astute in politicised South Africa, particularly on public sector projects;
- 56. Possesses a critical mass of business, legal, financial and commercial acumen and astuteness to ask and respond to probing questions in the broader stakeholder community;
- 58. Experience in and knowledge of the industry domain of the project, from a technical, contractual and institutional perspective;
- 59. Good negotiation skills, particularly in providing and securing the availability of resources for the project manager;

- 60. Interpersonal and critical thinking skills, including the ability to deal with ambiguity;
- 62. The competencies (combination of knowledge, personal attitude and skills) to fulfil the role;
- 63. Exhibits determination, ability to drive, tenacity, courage and resilience when conveying a sense of urgency and focusing on what matters most in leading for results and success;
- 64. Appropriate senior, empowered and accountable person with (personal and positional) power and credibility. Credibility understood in terms of being accepted by organisation and stakeholders as suitable for the role;
- 65. Understands the business, business case development, customer (market) and operations to enable the making of informed decisions; and
- 66. Understanding the role of the sponsor, its significance, and the need to align the project with the interests of the organisation.